

THE IRON AGE

A Review of the Hardware, Iron and Metal Trades.

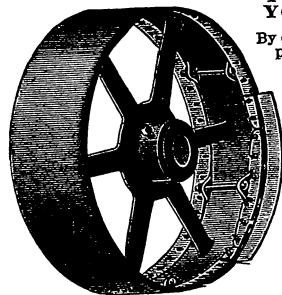
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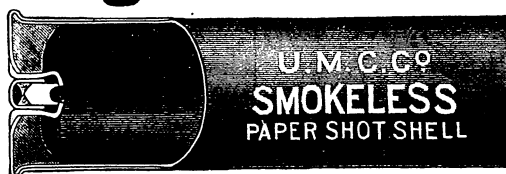
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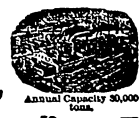
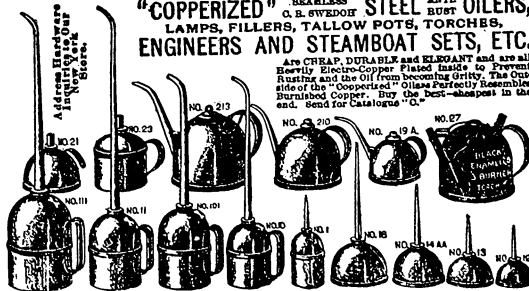
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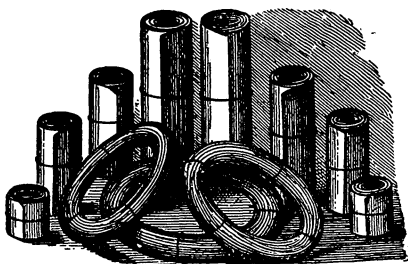
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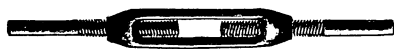
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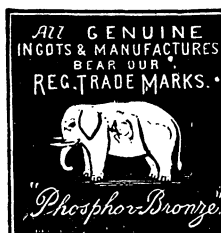
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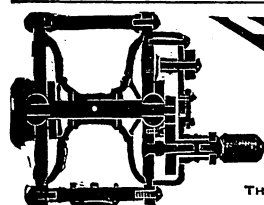
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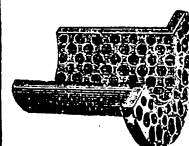
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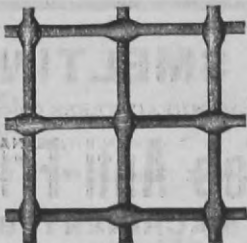
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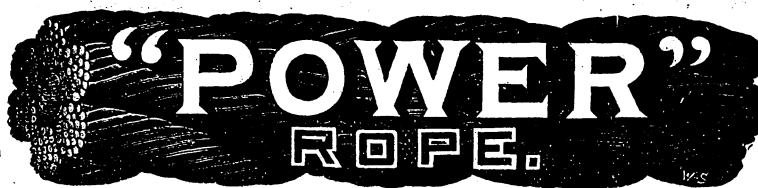
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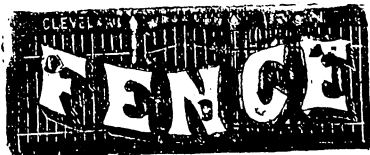
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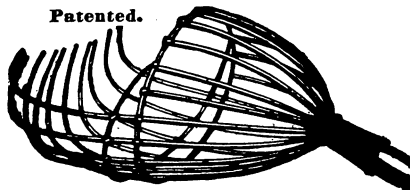
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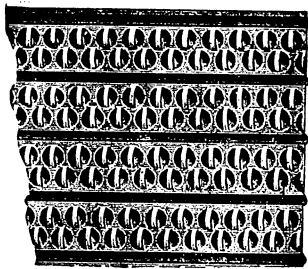
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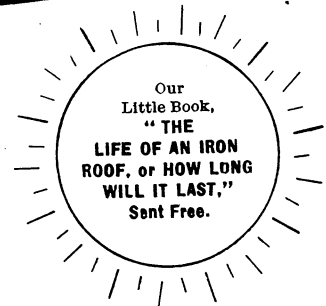
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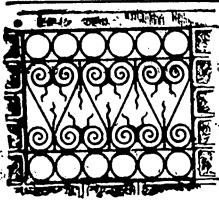
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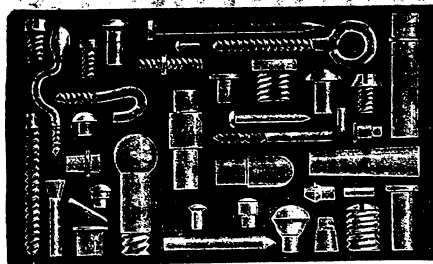
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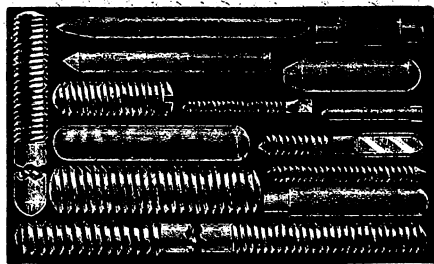
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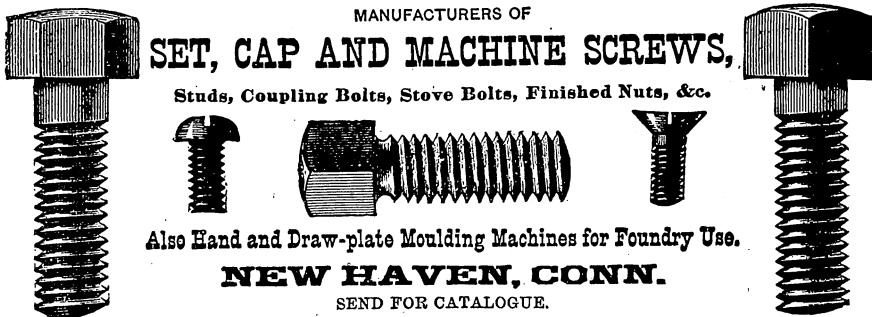
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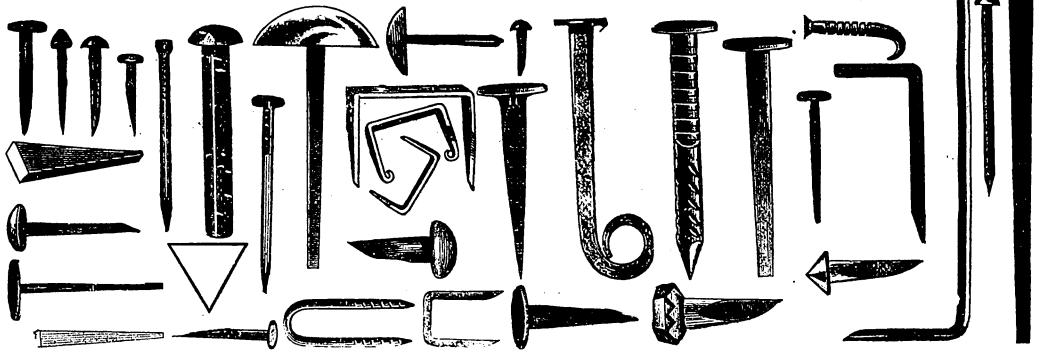
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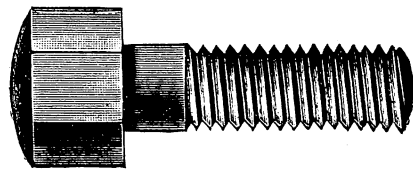


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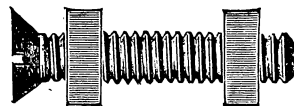
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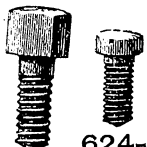
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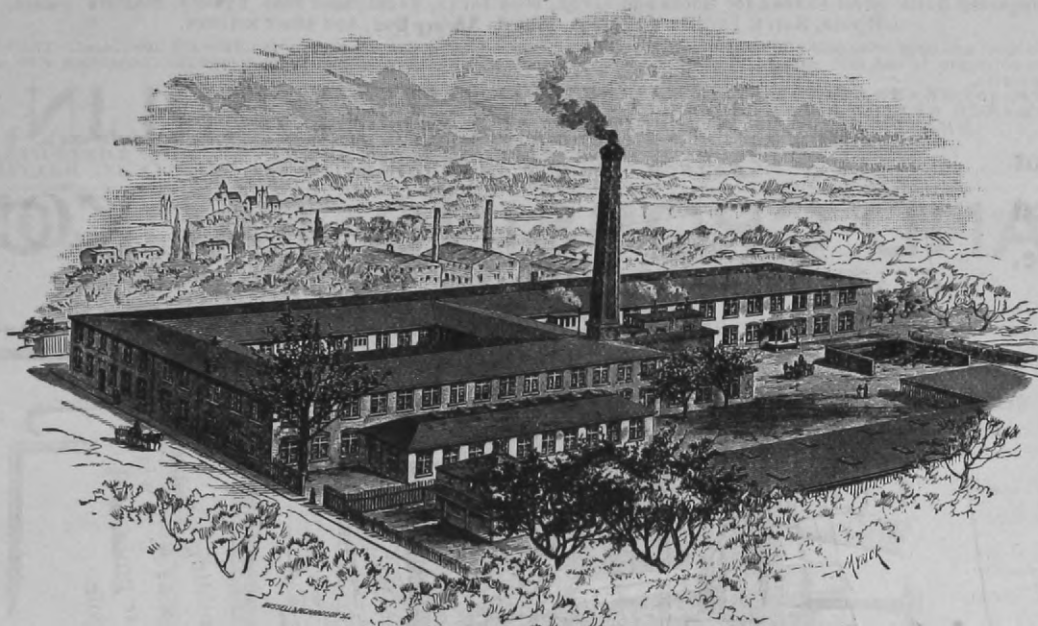
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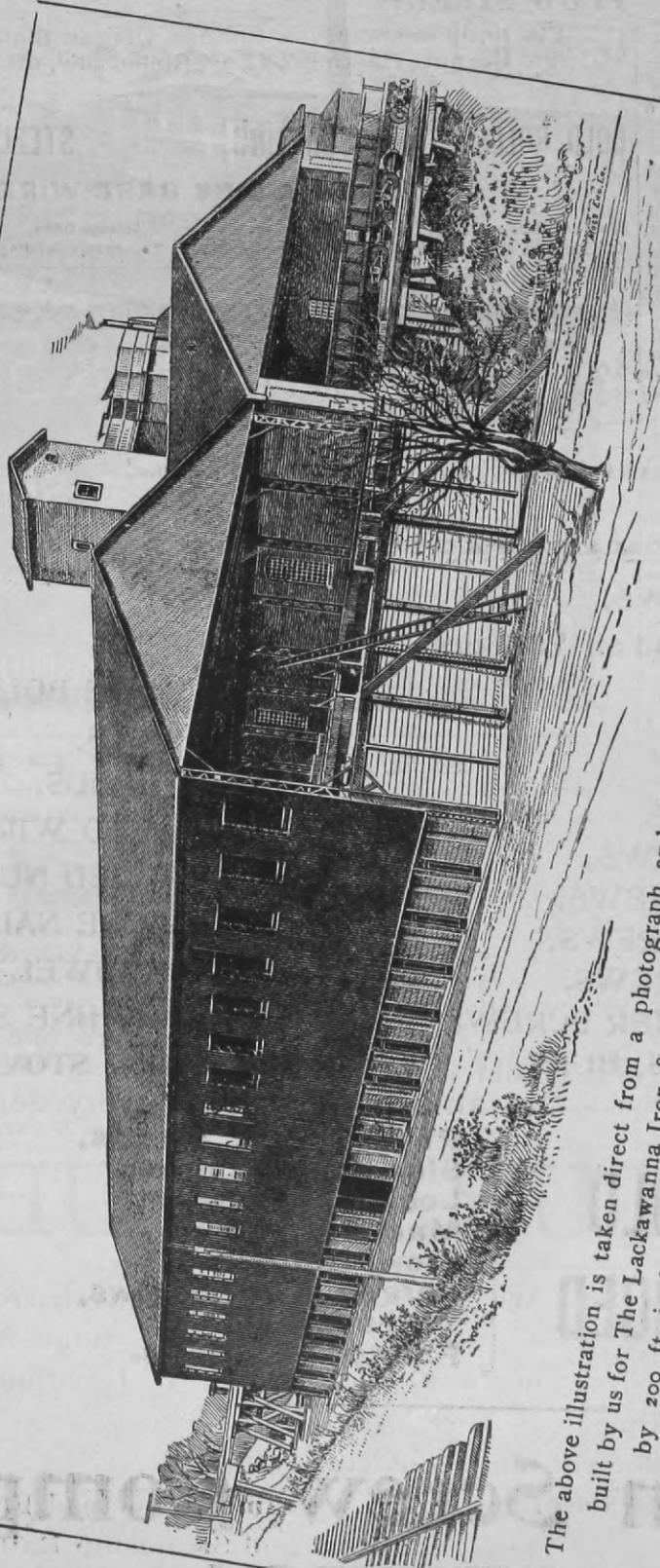
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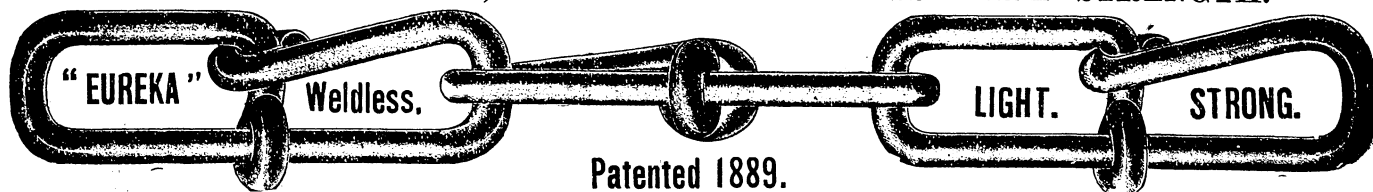
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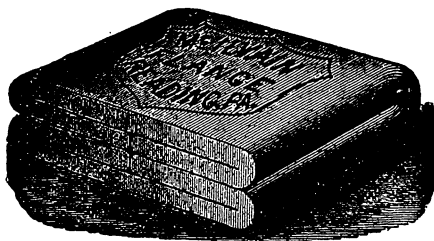
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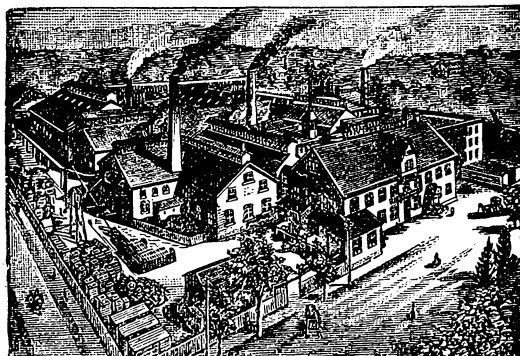
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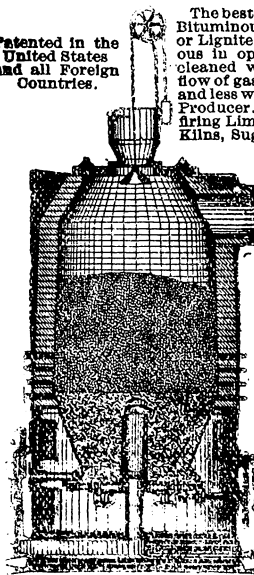
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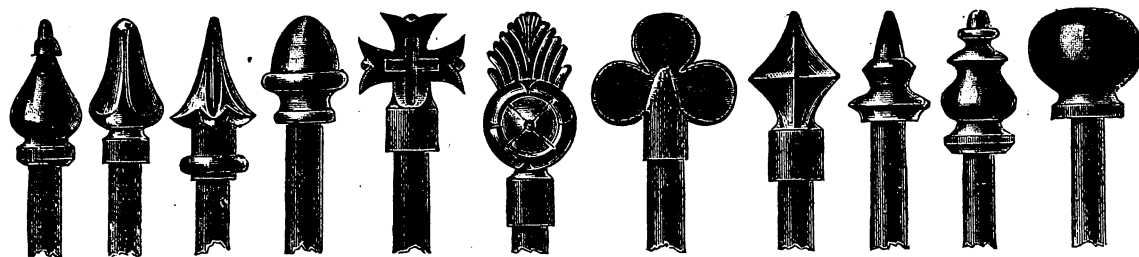
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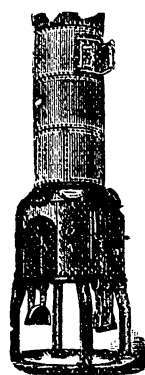
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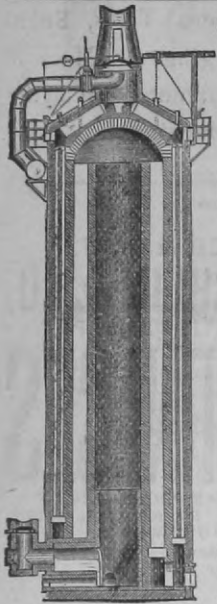
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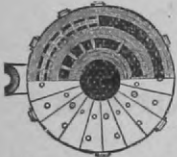
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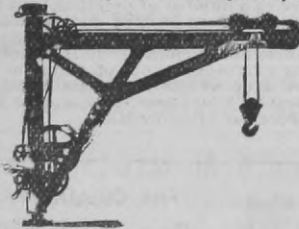
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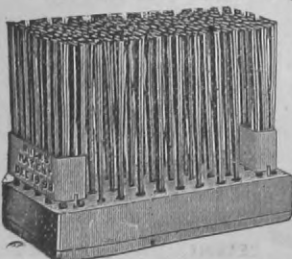
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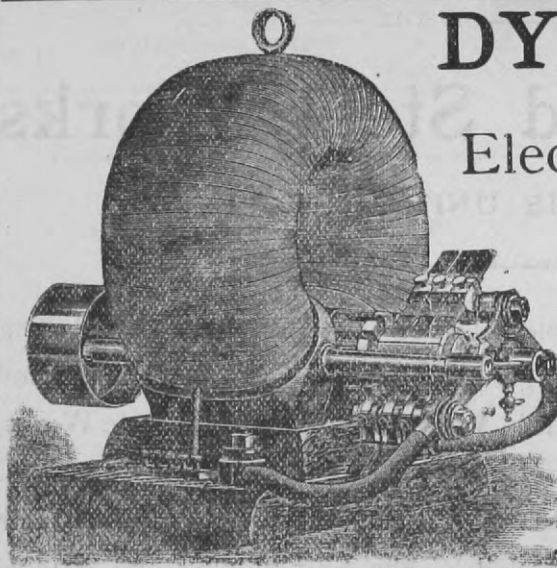
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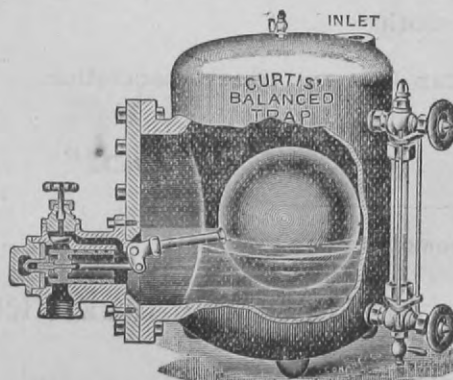
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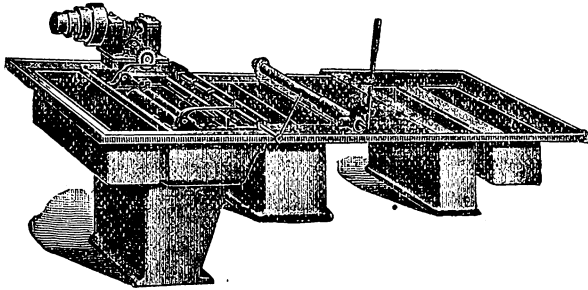
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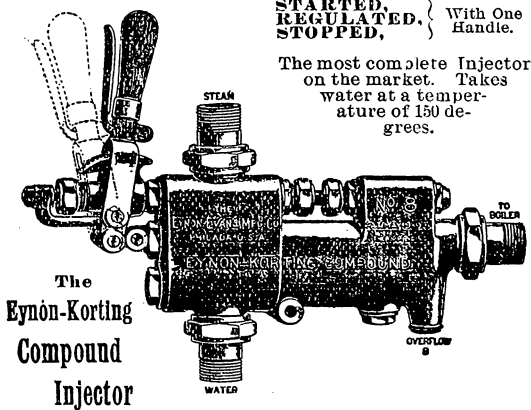
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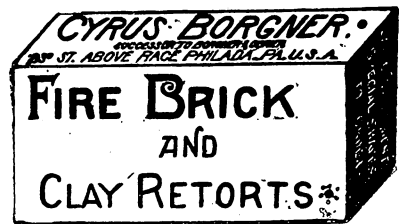
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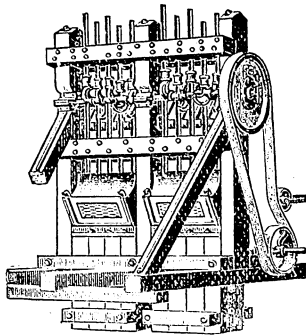
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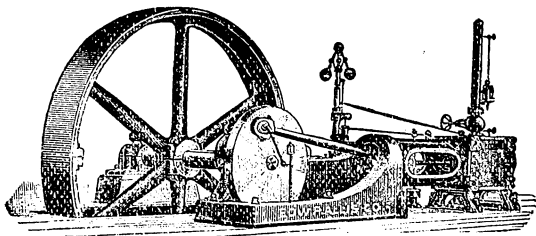
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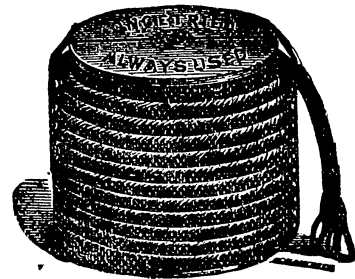
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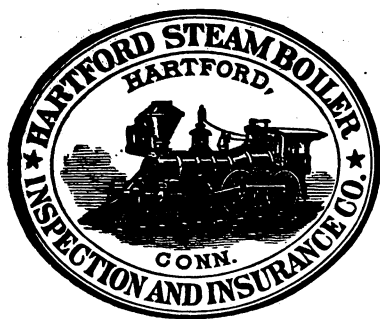
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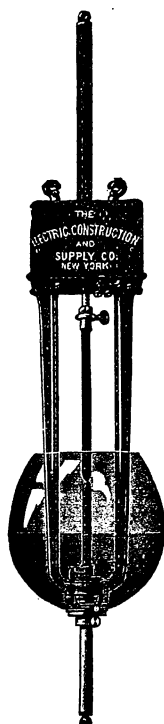
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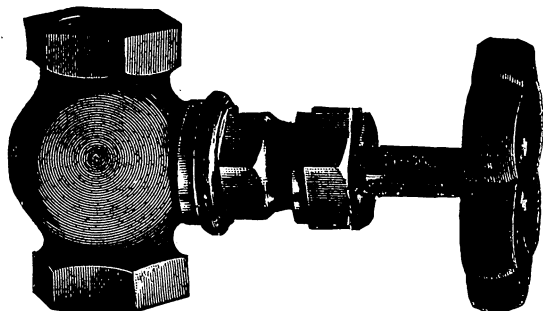
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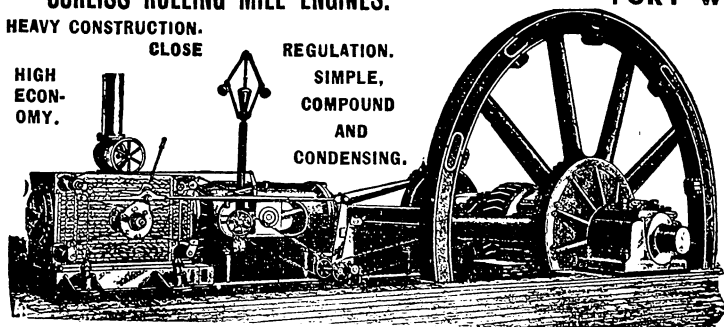
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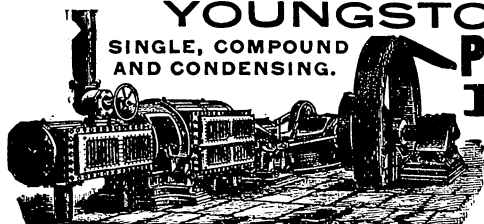
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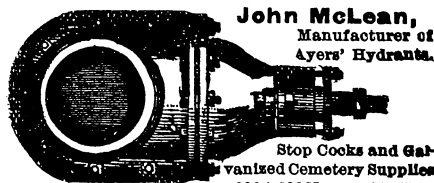
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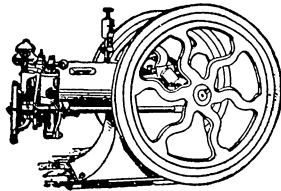


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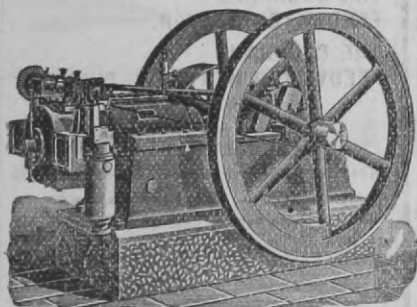


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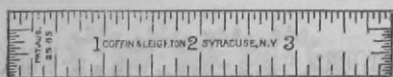
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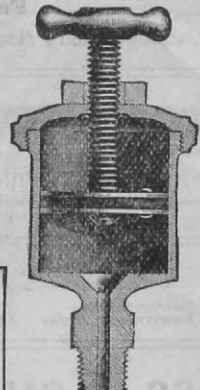
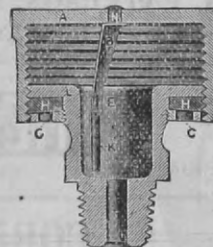
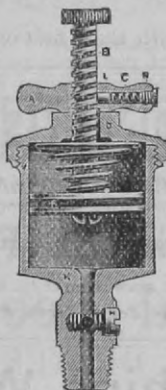
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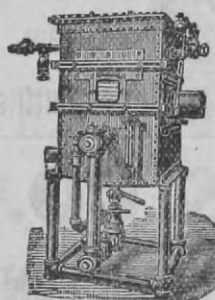
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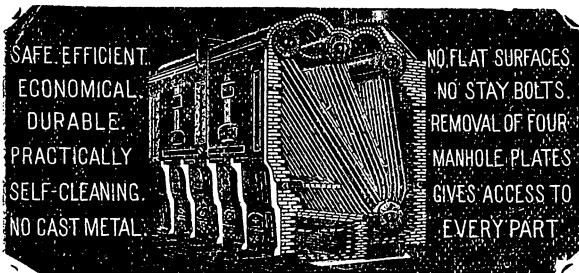
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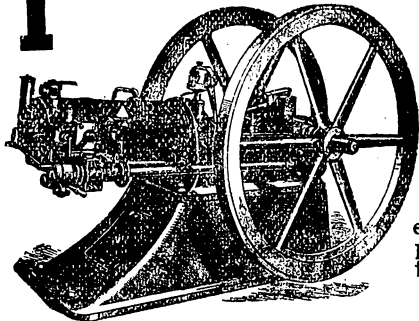


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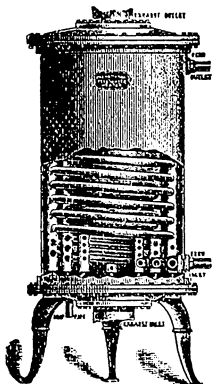
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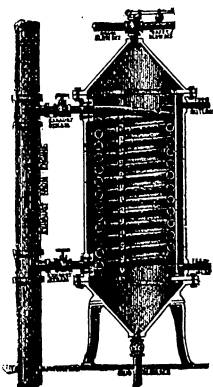
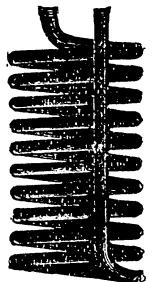


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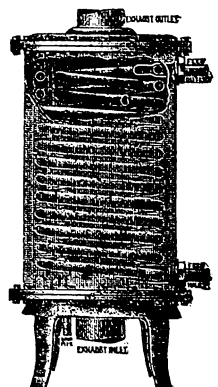
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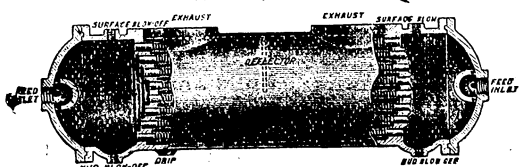
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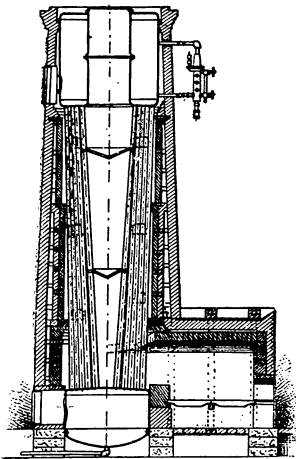
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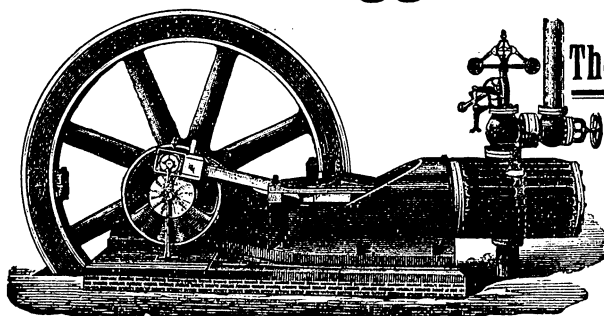
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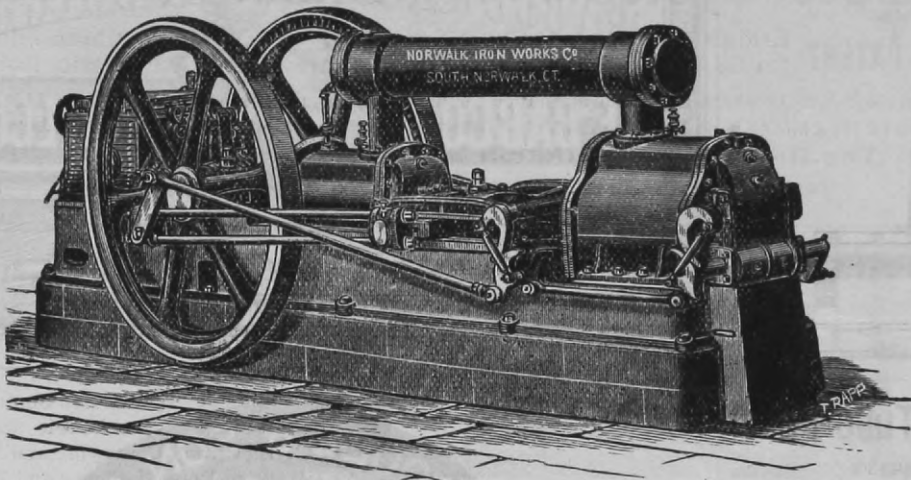
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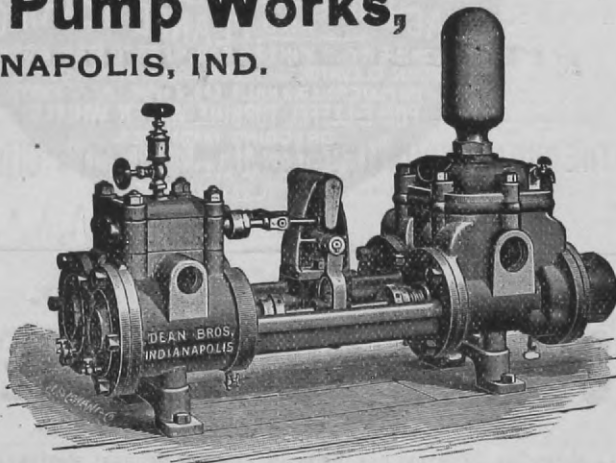
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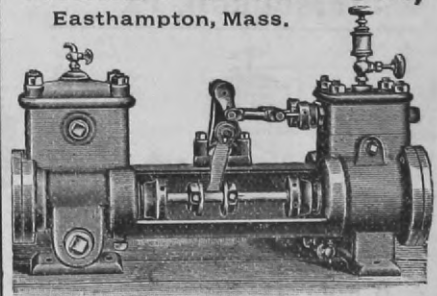


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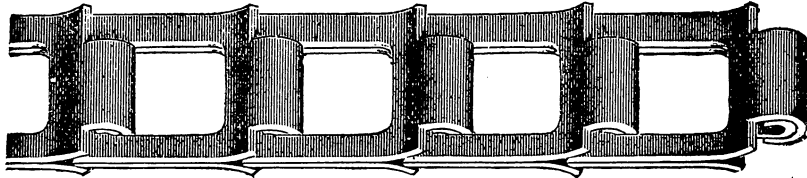
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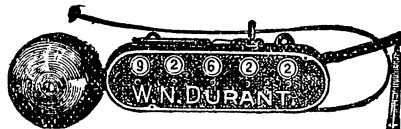
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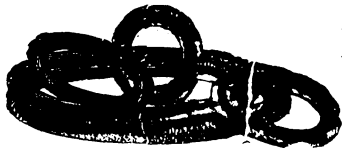
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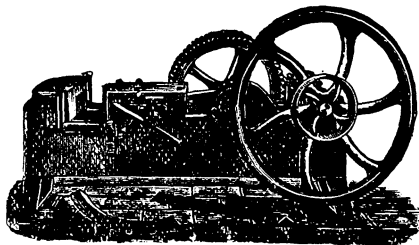
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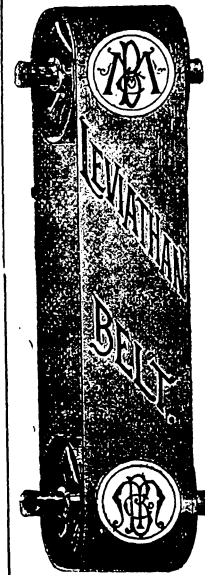
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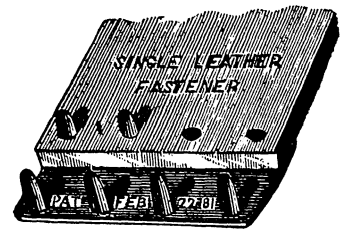
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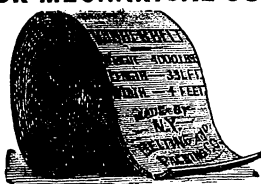
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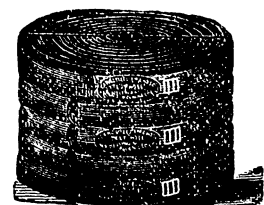


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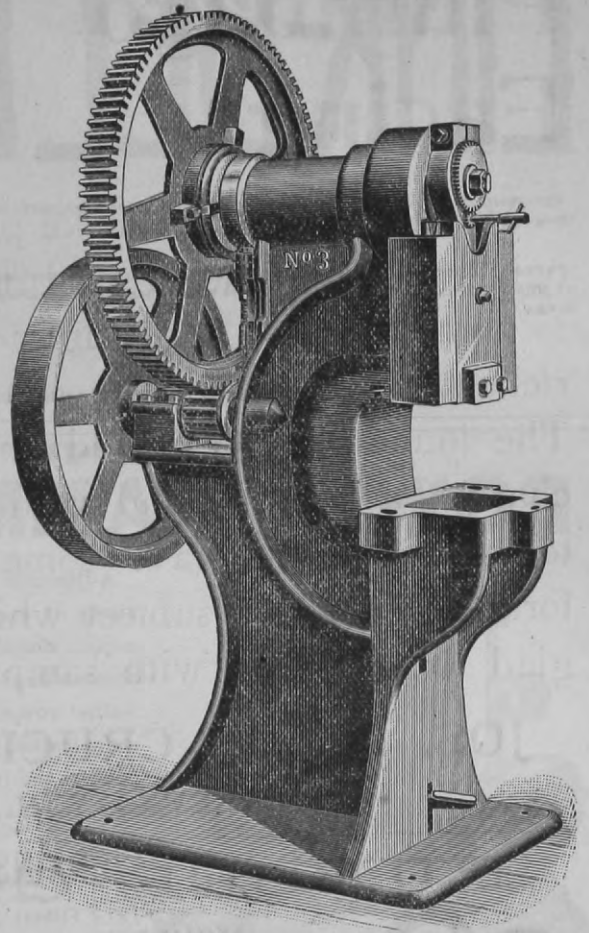
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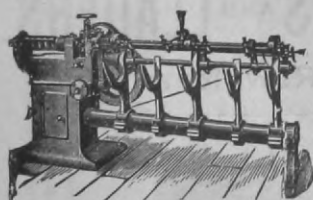


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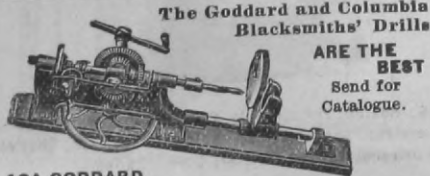
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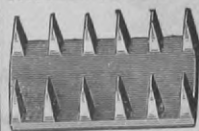


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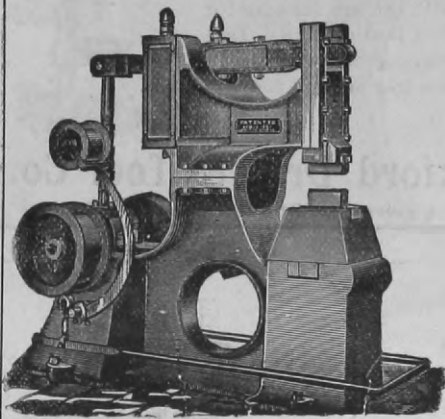
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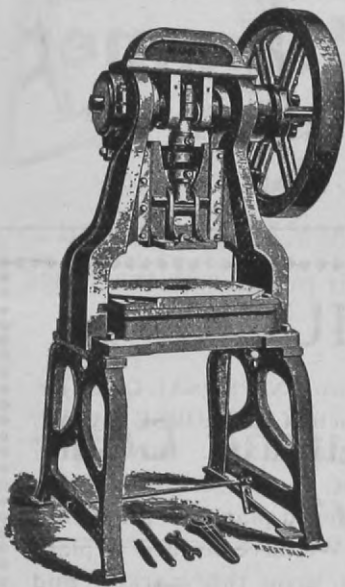
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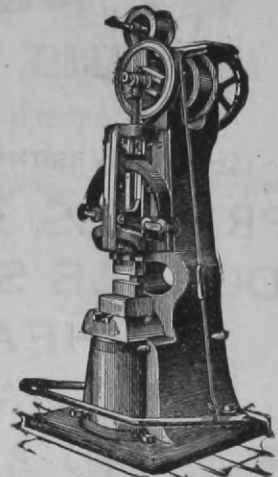
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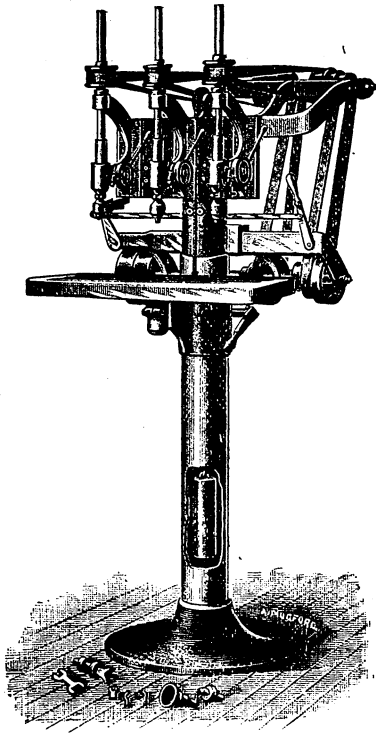


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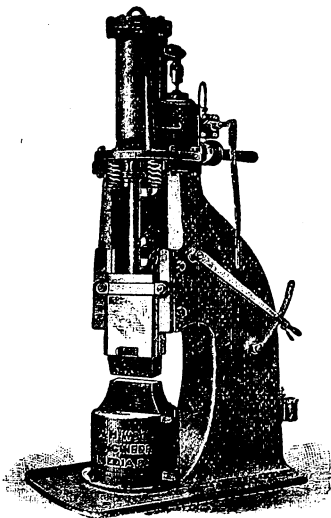
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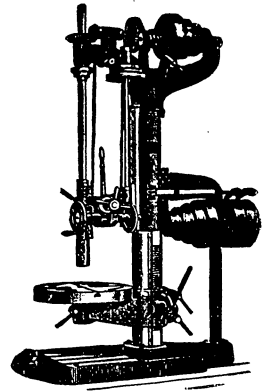
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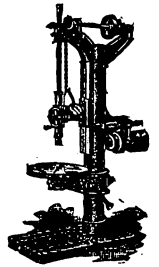
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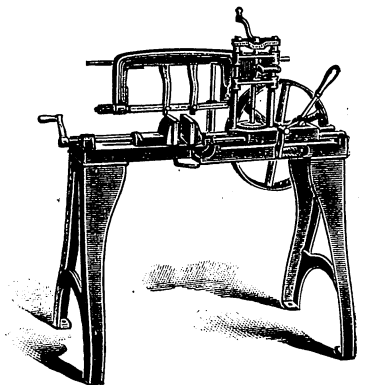
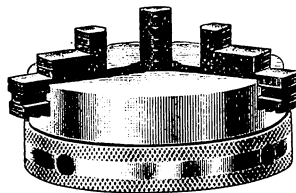


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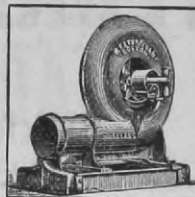
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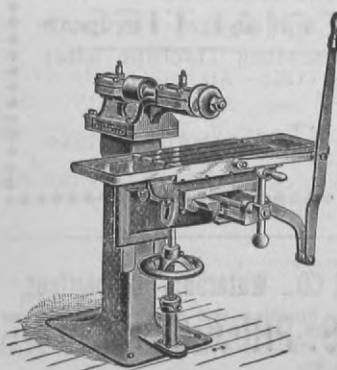
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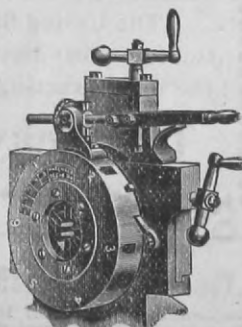
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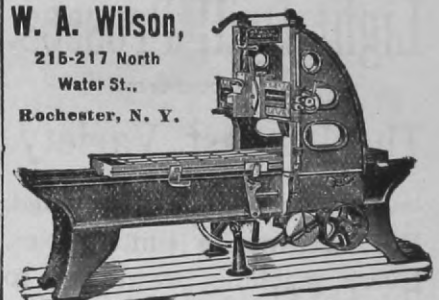
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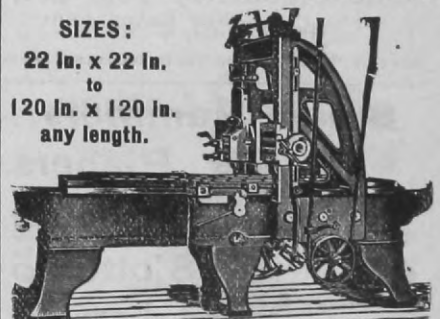


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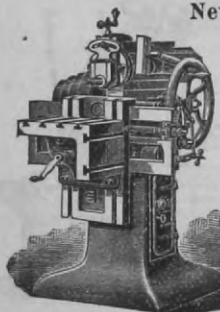
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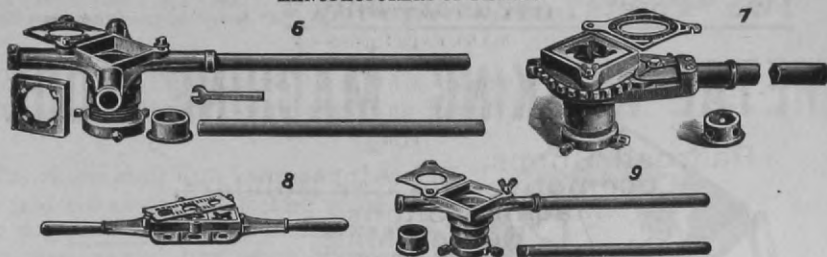
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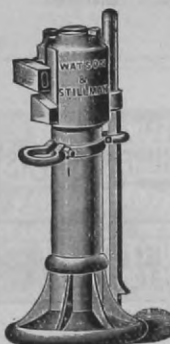
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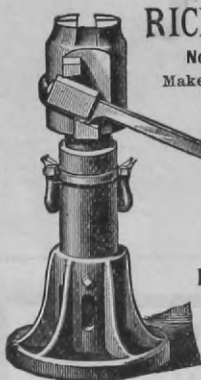
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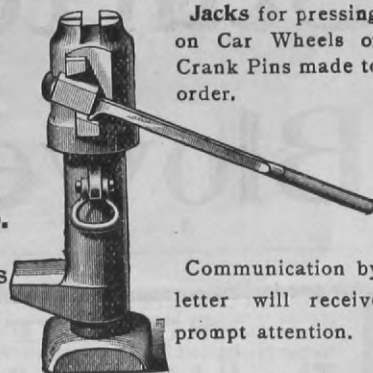
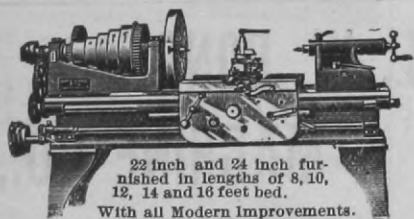
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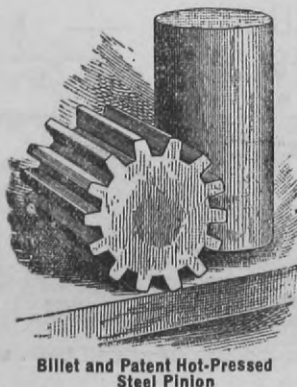
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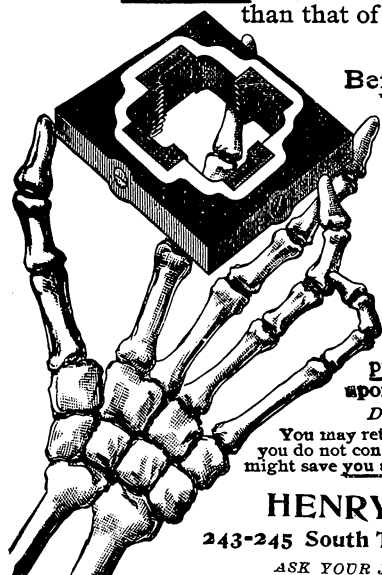
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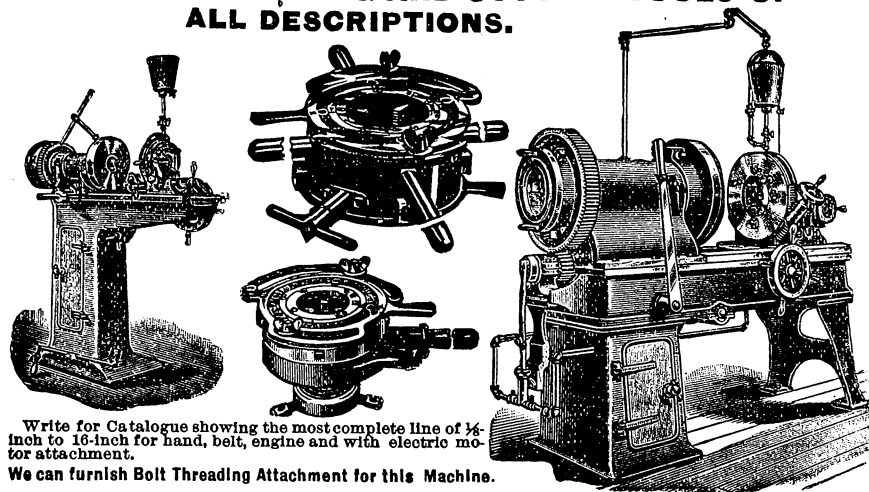
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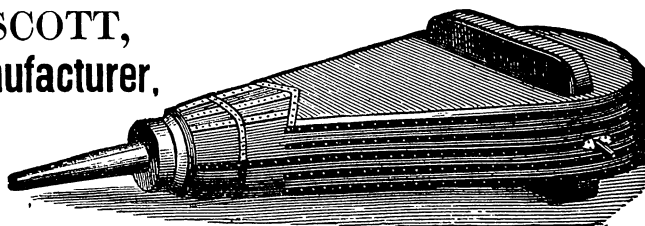
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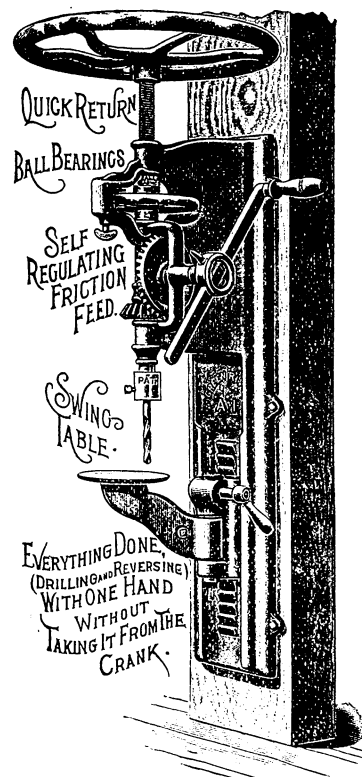
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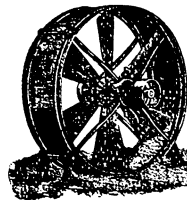
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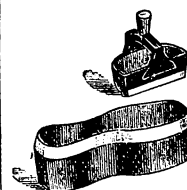
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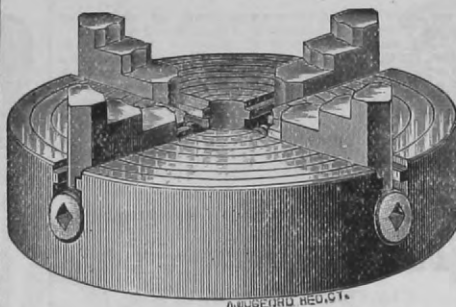
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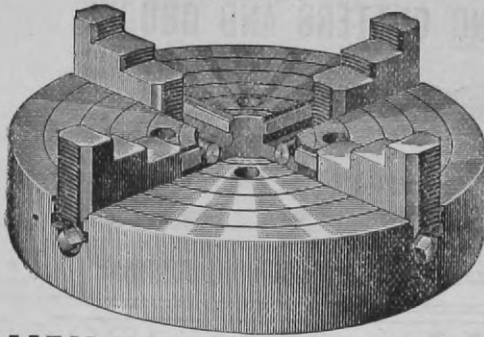
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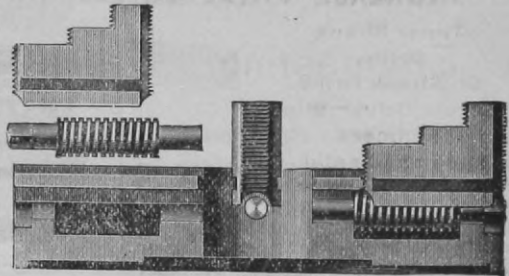
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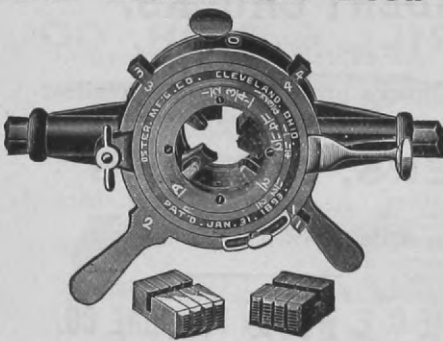
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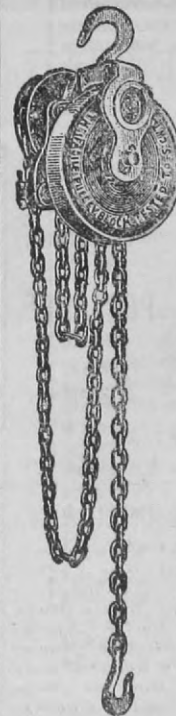
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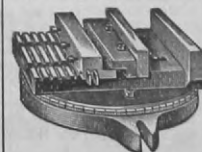
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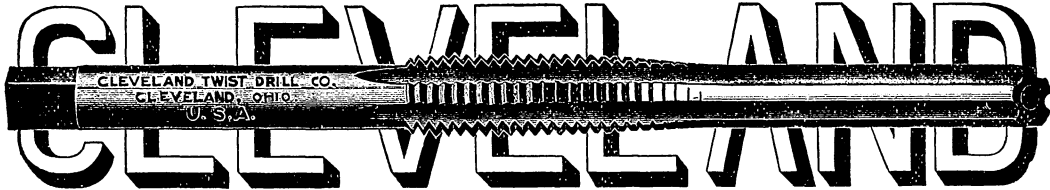
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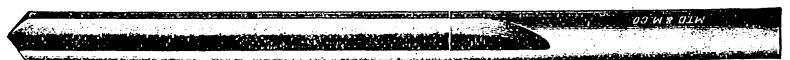
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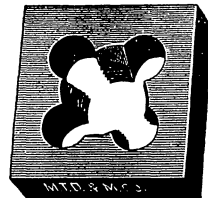
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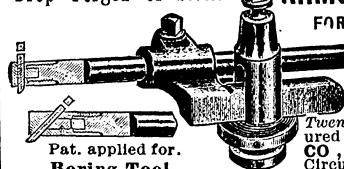
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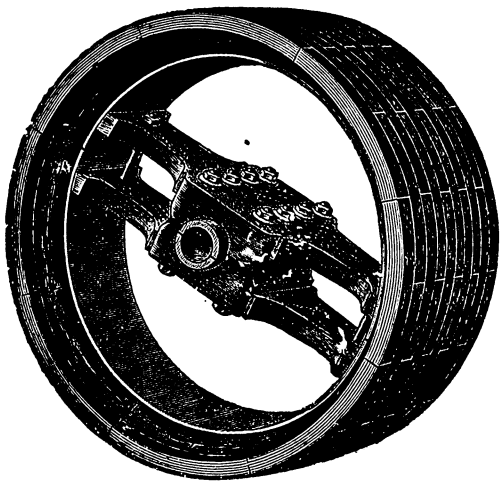
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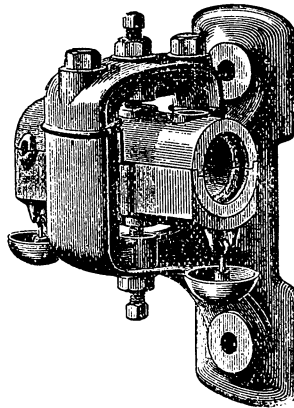
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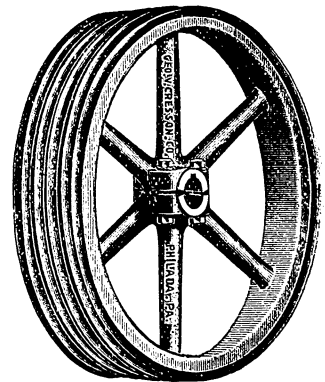
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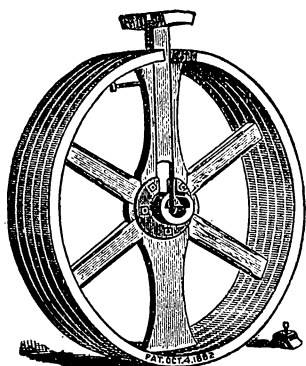
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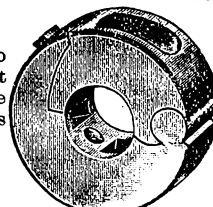
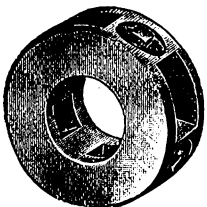
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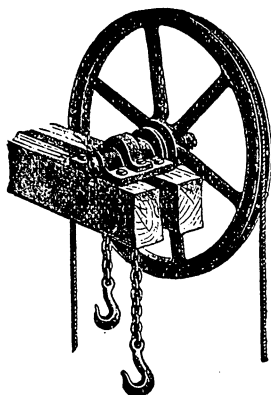
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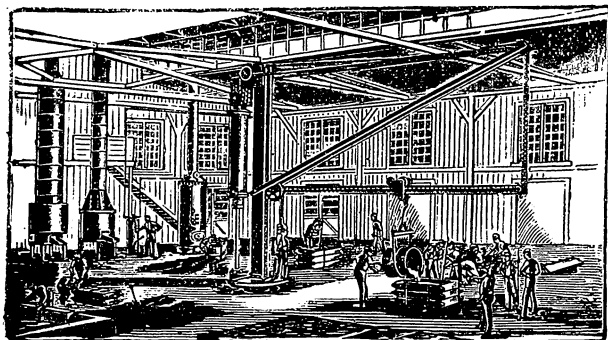
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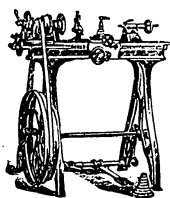
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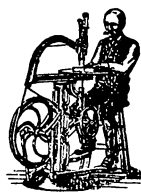
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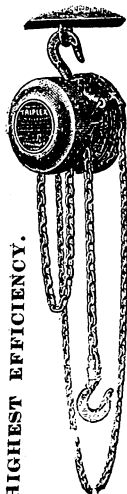
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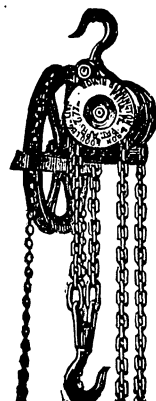
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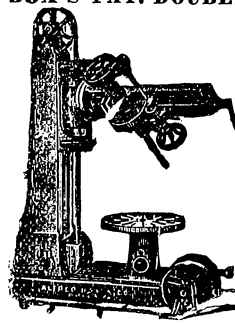
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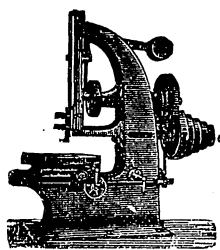
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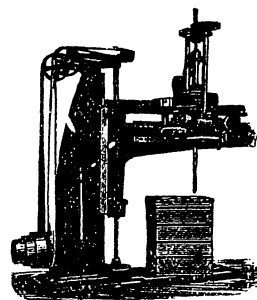


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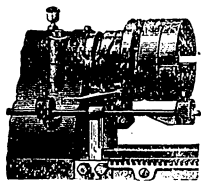
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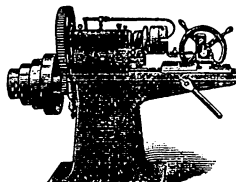
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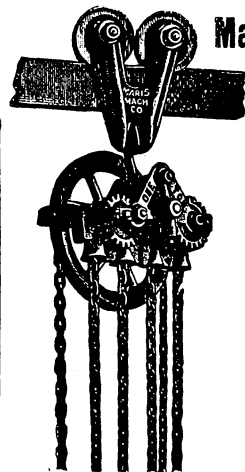


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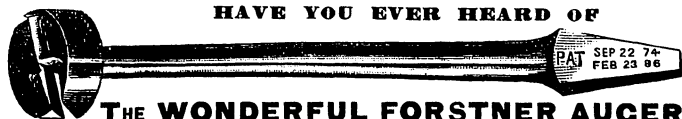
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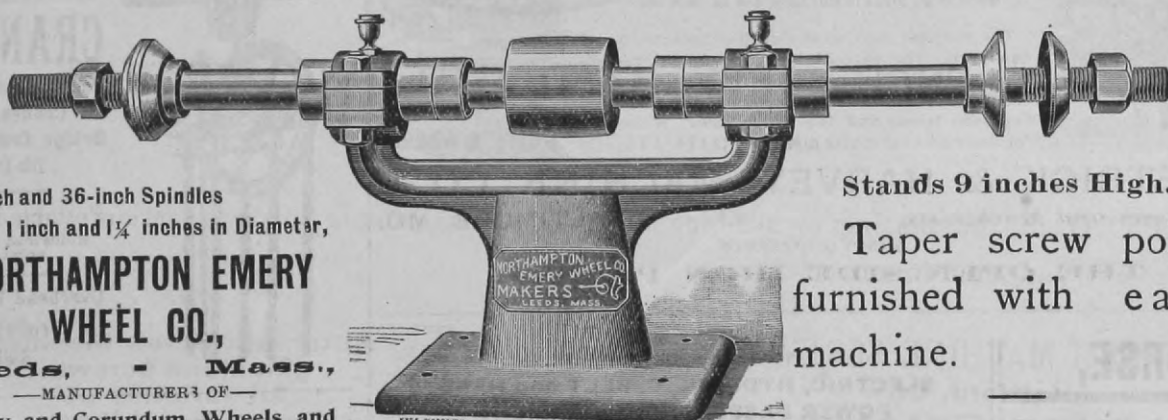
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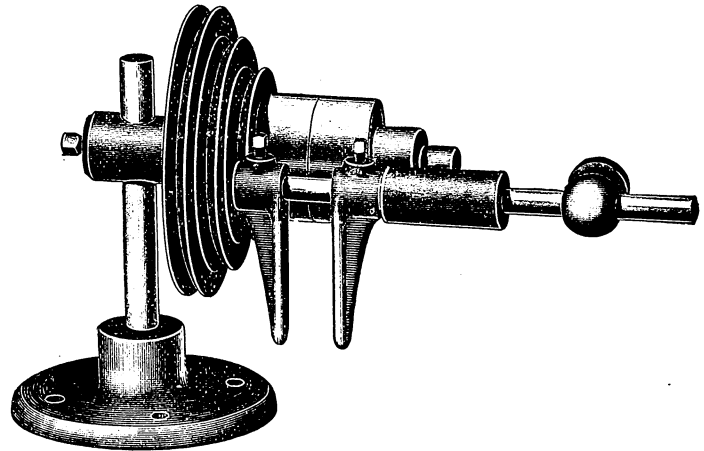
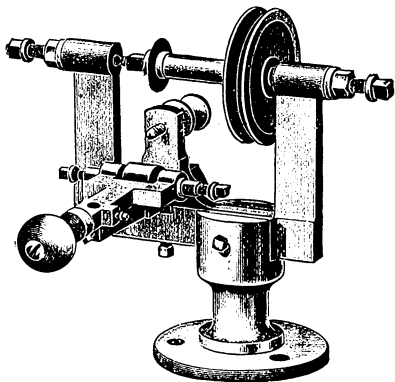
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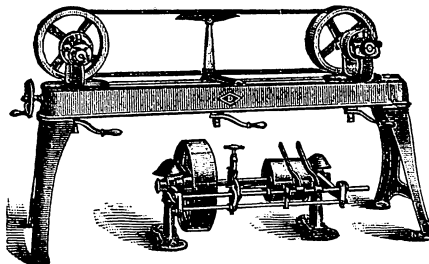


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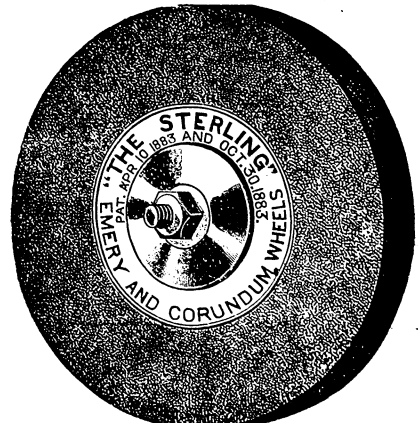
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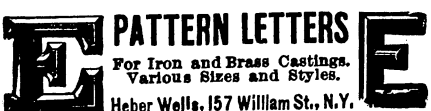


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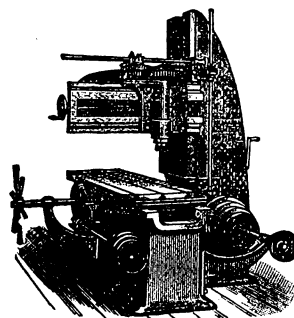
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Letters Patent No. 527,668,
Oct. 16th, 1894.

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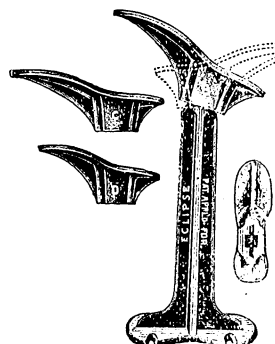
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A MECHANICAL ENGINEER with long and varied experience as superintendent desires position; is accustomed to office work, estimating and contracting, or would represent a responsible firm in New York; specialties, sugar house and plantation machinery, home and foreign; large circle of acquaintances; first-class references. Address "PRACTICAL," Box 1115, care *The Iron Age*, P. O. Box 521, New York City.

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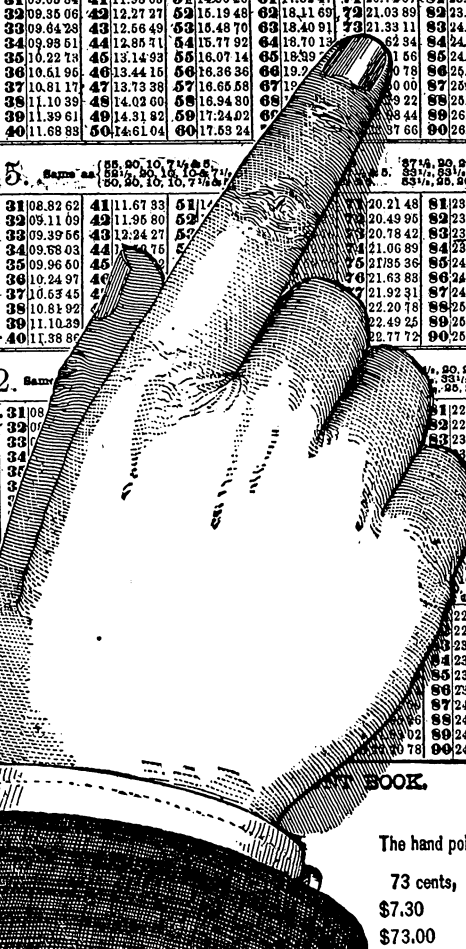
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401.16 88	404.09 09	407.01 30	409.93 51	412.85 71	415.77 92	418.70 13	421.62 34	424.54 54	427.46 75
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601.75 32	604.67 53	607.59 74	610.51 95	613.44 15	616.36 36	619.28 57	622.20 78	625.12 98	628.05 19
702.04 55	704.96 76	707.88 96	710.81 17	713.73 38	716.65 58	719.57 79	722.49 99	725.42 20	728.34 41
802.33 77	805.25 98	808.18 19	811.10 39	814.02 60	816.94 81	819.86 02	822.78 22	825.70 43	828.62 64
902.62 99	905.55 19	908.47 40	911.39 61	914.31 82	917.24 02	920.16 23	923.08 44	926.00 65	928.92 85
1002.92 21	1005.84 41	1008.76 62	1011.68 83	1014.61 04	1017.53 24	1020.45 45	1023.37 66	1026.29 87	1029.22 07

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300.85 41	303.70 13	306.54 84	309.39 56	312.24 27	315.08 98	317.93 69	320.78 40	323.63 11	326.47 82
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300.83 71	303.62 73	306.41 75	309.21 86	312.01 97	314.81 08	317.61 19	320.41 30	323.21 41	326.01 52
401.11 61	403.90 63	406.69 65	409.49 76	412.28 87	415.08 98	417.88 09	420.68 20	423.48 31	426.28 42
501.39 61	504.18 63	506.97 65	509.77 76	512.56 87	515.36 98	518.16 09	520.96 20	523.76 31	526.56 42
601.67 41	604.46 43	607.25 45	610.05 56	612.84 67	615.64 78	618.44 89	621.24 00	624.04 11	626.84 22
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802.23 22	805.02 24	807.81 26	810.61 37	813.41 48	816.21 59	819.01 70	821.81 81	824.61 92	827.42 03
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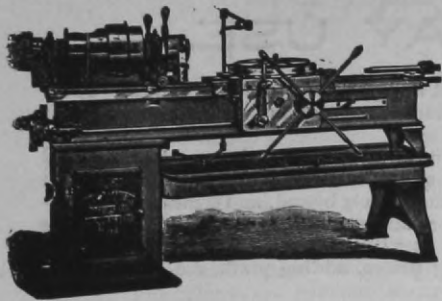
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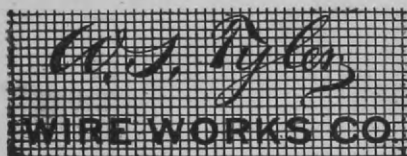
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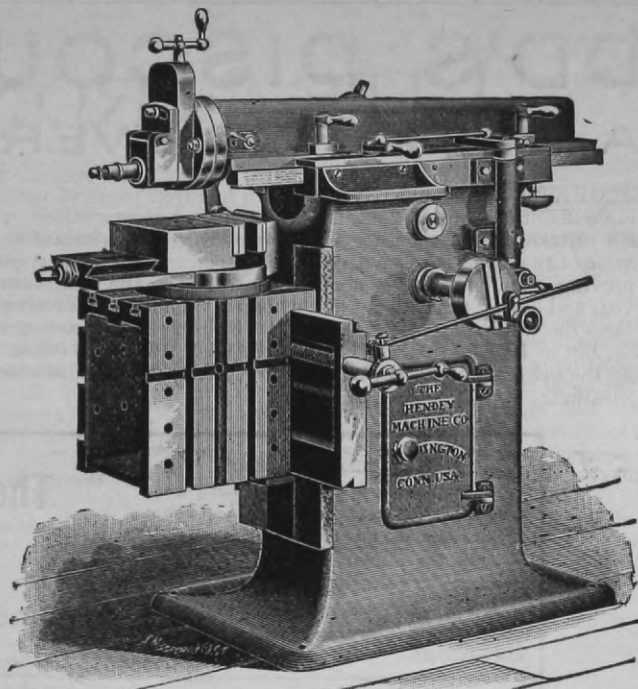
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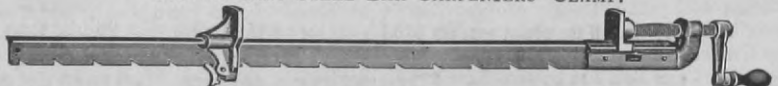
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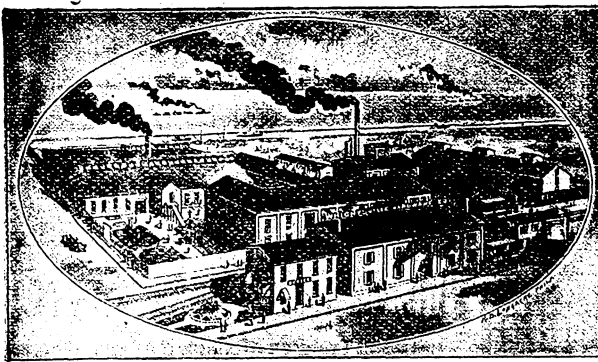
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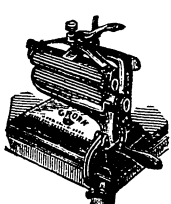
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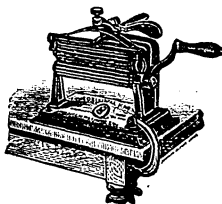
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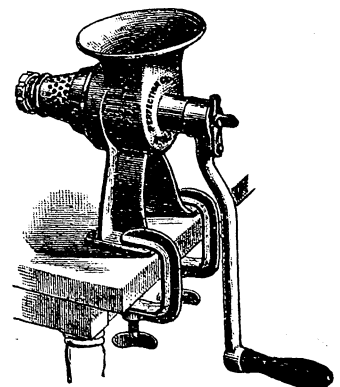
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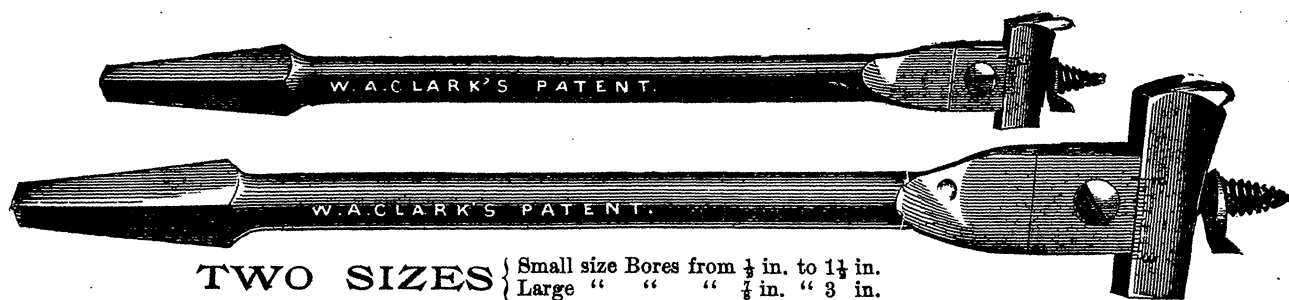
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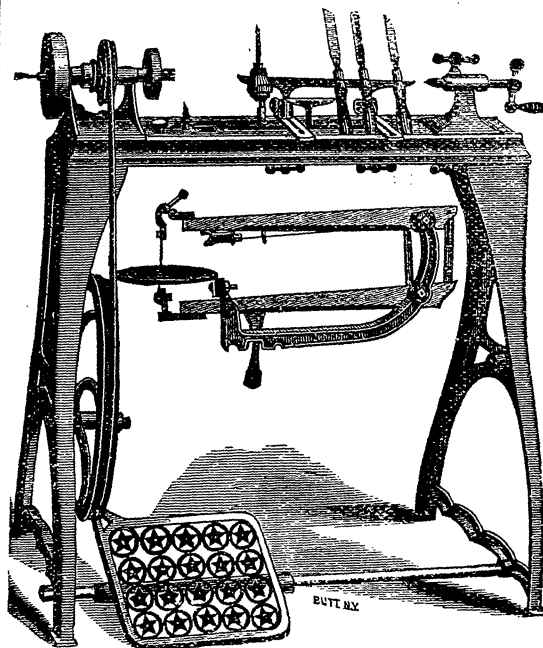


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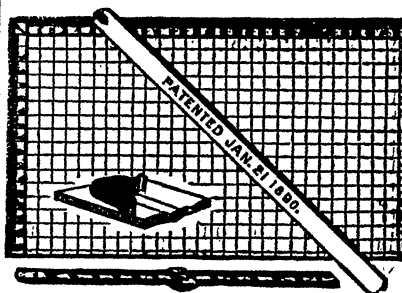
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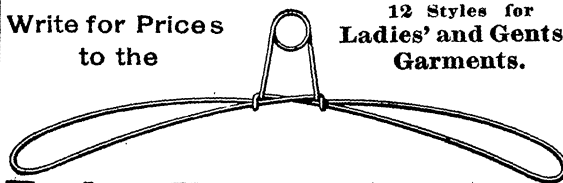
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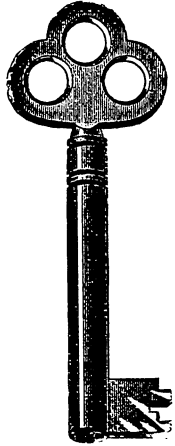


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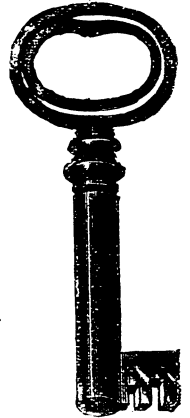
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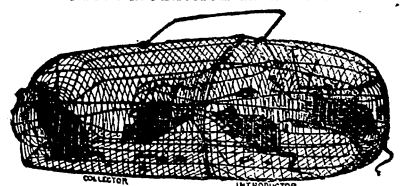
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STEEL STAMPS,

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Designs on Steel Finely Executed.

MARTY FRENCH TRAPS FOR RATS AND MICE.
Great Reduction in Price.



On account of the lower rate of duties under the new tariff we are now prepared to furnish all sizes at greatly reduced prices.
Remember we are the **sole importers** of the **genuine Trap**. All others are flimsy and worthless imitations. Get our Quotations.
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THE OLDEST AND MOST EXTENSIVE MANUFACTURERS OF

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Yard Hydrants, Street Washers, Galvanized Pump Chain, Wind Mill Pumps and other Hydraulic Machines in the World.

DOUGLAS' DIAPHRAGM PUMPS, "Loud Patent."

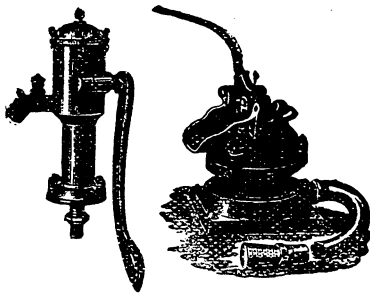
A LARGE CAPACITY AND EASY WORKING PUMP FOR

Water Works, Sewer Contractors, Foundation Builders, Mines, Quarries;

Fig. 200.

Fig. 381.

Fig. 145.



or wherever it is desired to raise a large quantity of water by hand power.

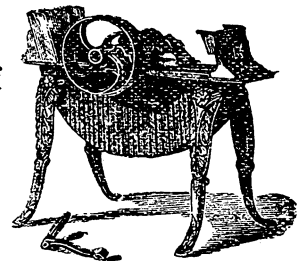
The pump has large valves (accessible by hand), and will pump water containing sand, gravel, sewage matter, &c., without choking or any perceptible wear.

CAPACITY

from 3,000 to 4,500 gallons per hour.

These pumps are simple, durable and low priced. Made either as shown in cut for Hose or for IRON Pipe Suction underneath.

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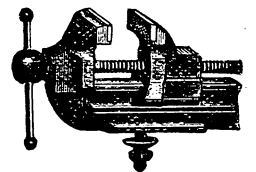
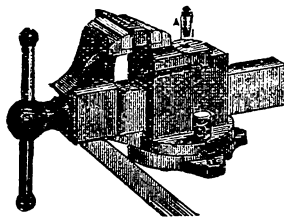
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The Largest Pump and Hay Tool Works.

Ashland Pump and Hay Tool Works.

PENINSULAR ALL-ROUND SHOVELS

SPECIALLY ADAPTED FOR USE IN THE FURNACE ROOM.

The larger sizes make excellent snow and barn shovels. Best Quality Steel.

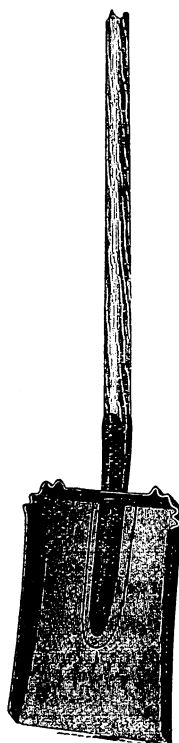
DOUBLE EDGE—CORNERS FOUR PLY.

Long-handled, light, stiff and shapely. The lightest Steel Furnace Shovel made, at the same time very stiff and durable. The only shovel on the market the proper shape both for handling coal and for taking up ashes. Can be used for any purpose for which any other shovel is commonly used. Prices much lower than any other shovel used in the furnace room. Three sizes:

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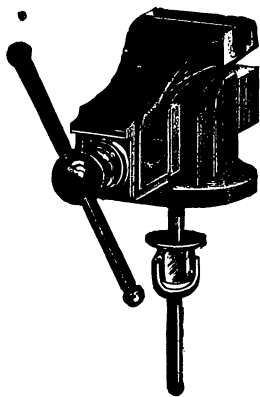
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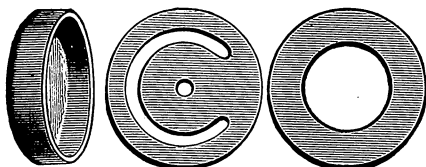
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Specially adapted for drill press work where chucks cannot be used and equally good for special or regular bench work.

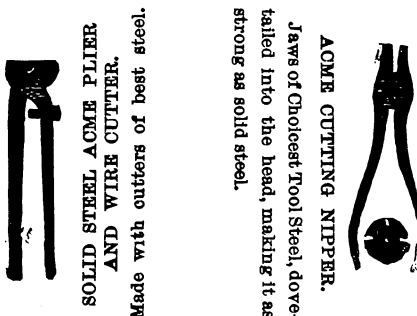
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ACME CUTTING TOOLS.

Made in all Sizes.



SOLID STEEL ACME PLIER
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Made with cutters of best steel.

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Machine Knives, Shear Blades,
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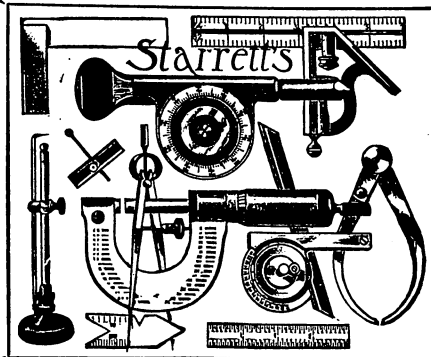
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Skilled mechanics prefer them

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Best
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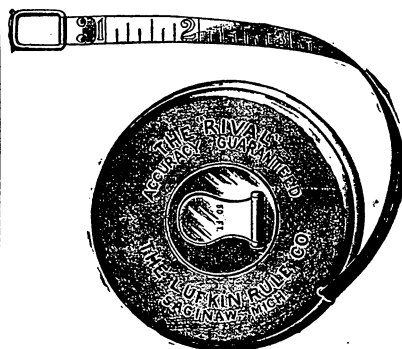


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Every
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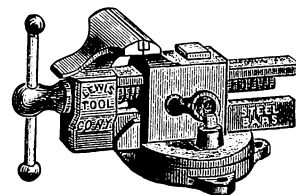
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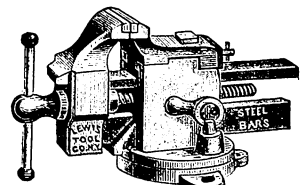
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All Kinds of Vise
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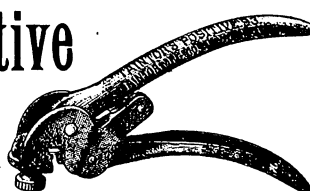
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Taintor Positive

Saw Set 93.



ANN ARBOR, MICH., May 5, '94.
I have given the Taintor Saw Set a thorough trial on both coarse and fine saws and find that it works like a charm. As you have named it "Positive," I think you struck the right name, for it is certainly a set that can't be beat.

Yours truly,
A. JONES.

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I have given the Taintor Saw Set a good trial. I find it is perfect. It will do all your circulars claim for it. It sets a saw to perfection, and has no weak points about it. I can recommend it to all carpenters. They should add it to their kit of tools.

Yours very respectfully,
THOS. H. TACKLESON.

THE BRADY MANUFACTURING
Co.,
Engineers and Contractors,
BROOKLYN, N. Y.,
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TAINTOR MFG. Co., New York.
GENTLEMEN: It is my opinion that, everything considered, a better Saw Set than your 93 pattern will never be made.

JAMES BRADY, Manager.
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TAINTOR MFG. Co.
GENTS: I have given the Taintor Saw Set a good trial and found it perfect, and I recommended it to the carpenters here.

J. F. RIEGSECKER.

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Oct. 8, 1894.

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I have given the Set several trials, and especially on one saw that I could not set with a lever set. I had to take a strike set and go over it several times in order to get the desired set, but your Saw Set gives it the desired set to perfection, and I freely recommend it to mechanics who like to have an even and uniform set.

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SAWS

WENTWORTH'S PATENT NOISELESS SAW VISES, WITH RUBBER CUSHIONED JAWS.

Prevent all vibration and render Saw Filing noiseless.
Will make no more noise than Filing on a Solid Piece of
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Have a Larger Sale than All Other Kinds Combined.

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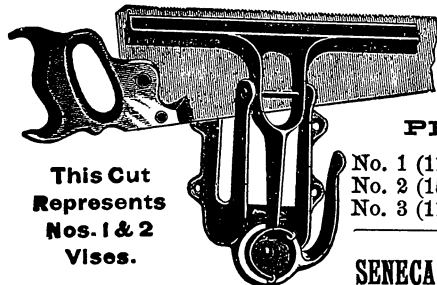
No. 1 (11 inch Jaws),	-	PER DOZ. \$15.00
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LIBERAL DISCOUNT TO THE TRADE.

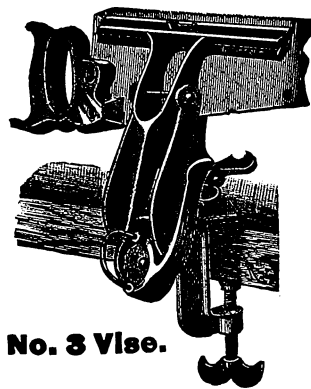
LONGEST JAWS, HEAVIEST AND
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Sold by all leading jobbers of gen-
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This Cut
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CIRCULAR, BAND, CROSS-CUT AND HAND SAWS. ATKINS' COLUMBIAN CROSS-CUT SAW.

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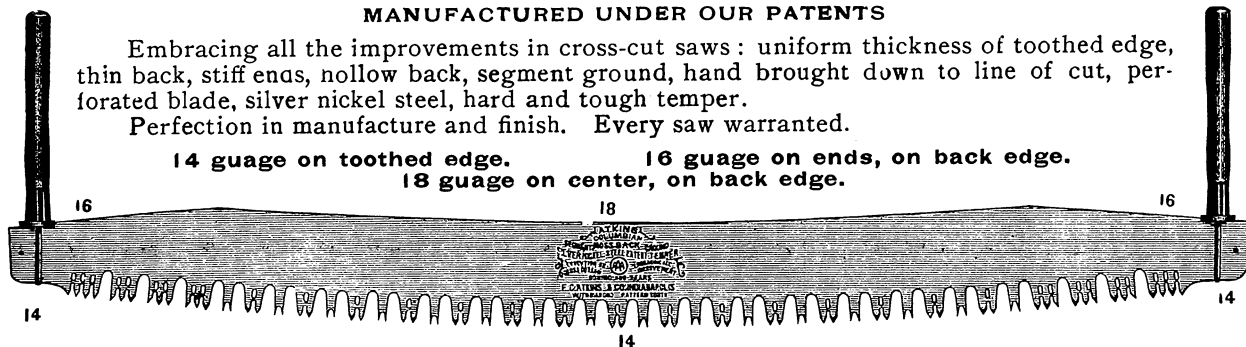
Embracing all the improvements in cross-cut saws: uniform thickness of toothed edge, thin back, stiff ends, nollow back, segment ground, hand brought down to line of cut, per-
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Perfection in manufacture and finish. Every saw warranted.

14 guage on toothed edge.

16 guage on ends, on back edge.

18 guage on center, on back edge.



The toothed edge of the Columbian Saw will remain same thickness until teeth are worn out—on other
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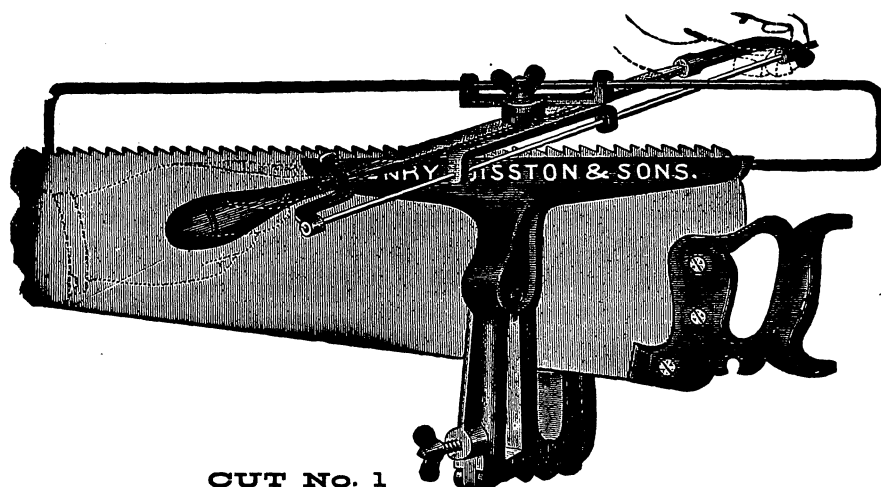
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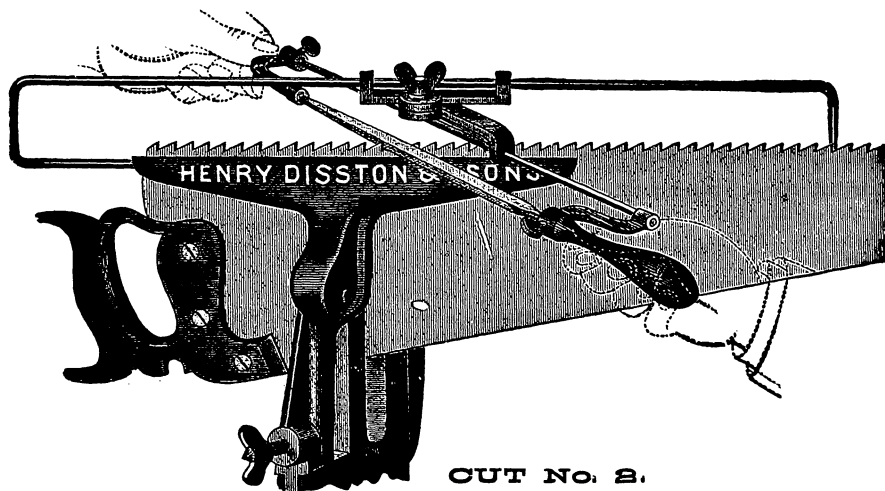
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To obtain the correct position, loosen the wing nut and move the guide around to the point desired; after tightening wing nut, loosen screw in file handle, then turn handle until file gives the shape tooth wanted.


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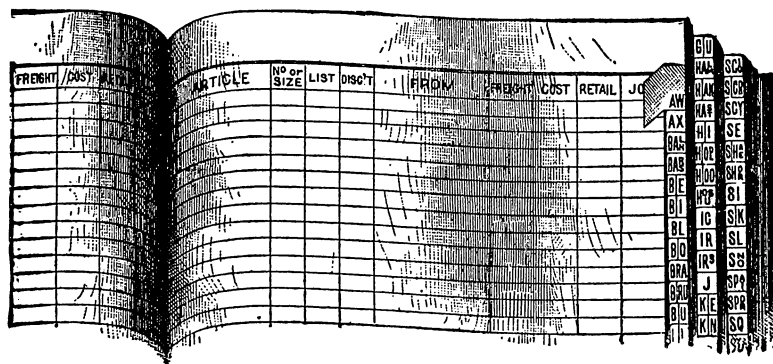
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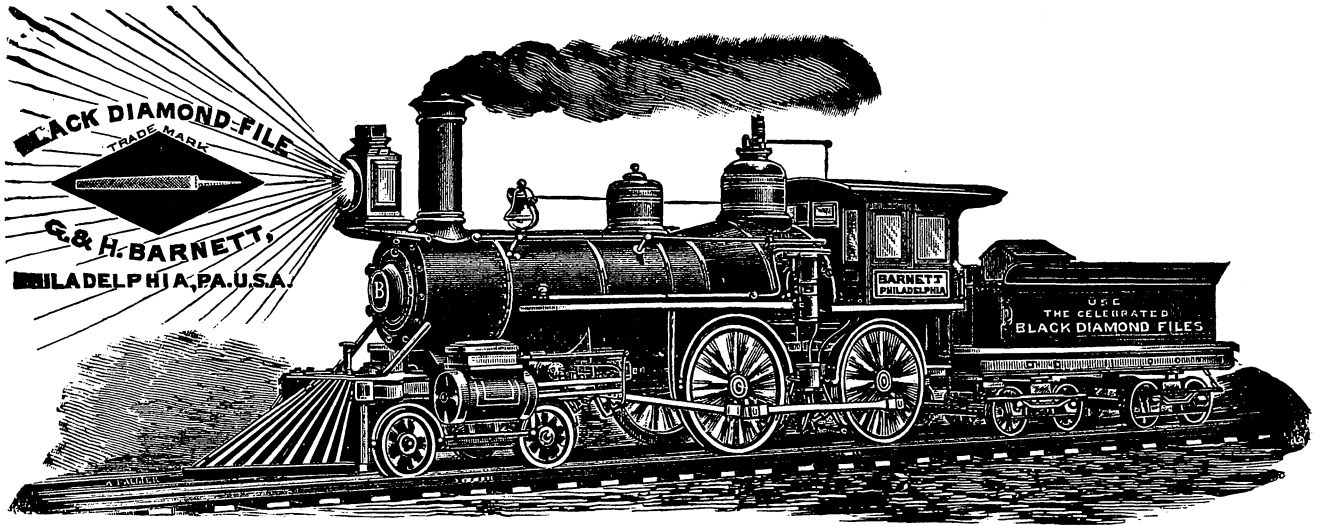
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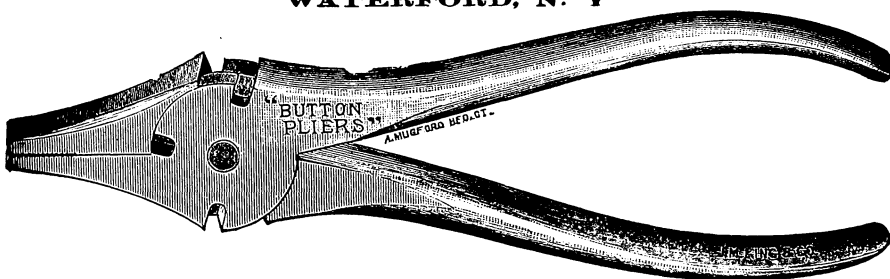
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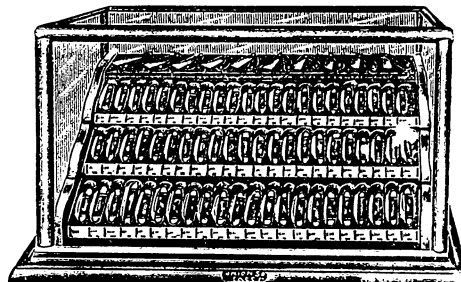


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The Most Complete Assortment in the U. S. of
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Chisels, Fine Bevel Edge Chisels, Plane Irons.

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Shears, Trimmers, Scissors, Tinnors' Snips, &c.

ALL GOODS OF OUR MANUFACTURE ARE STAMPED

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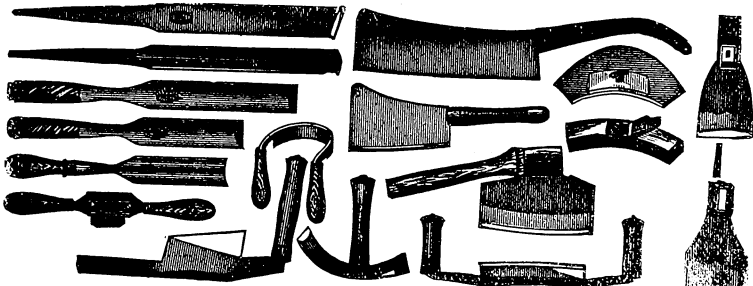
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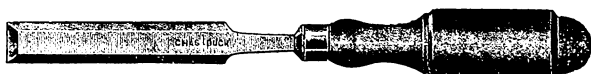
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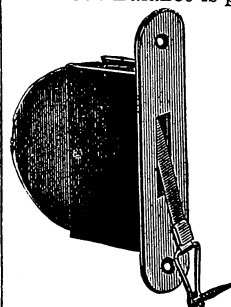
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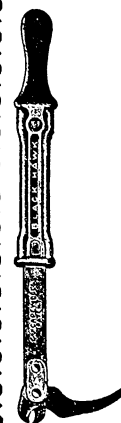
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PULL IT

Easiest and quickest is to
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NAIL PULLER.

We stand responsible to
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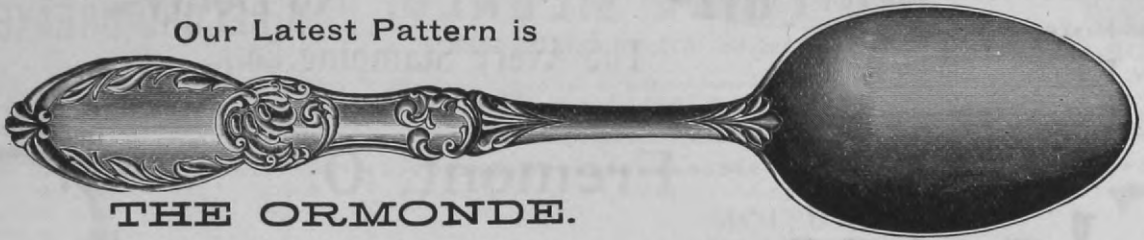
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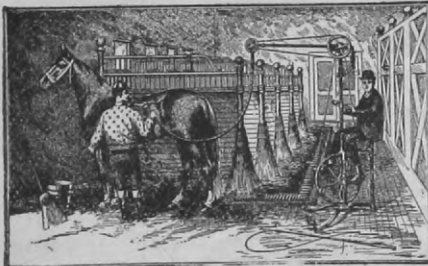
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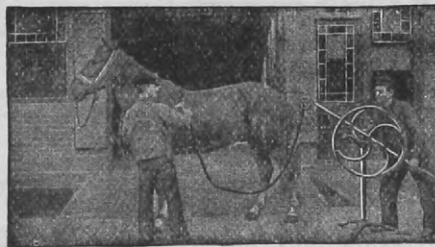
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FULL SIZE.

THE HOLMES & EDWARDS SILVER CO., - - Bridgeport, Conn.

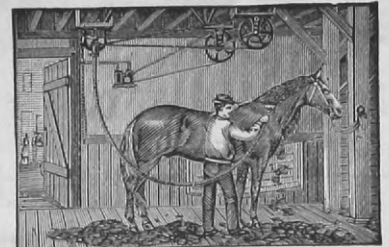
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SALES OF
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alone during the past year, distributed throughout the United States, and not a single piece complained of, justifies us in guaranteeing that it will give absolute satisfaction.

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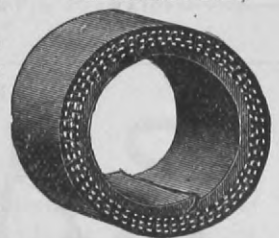
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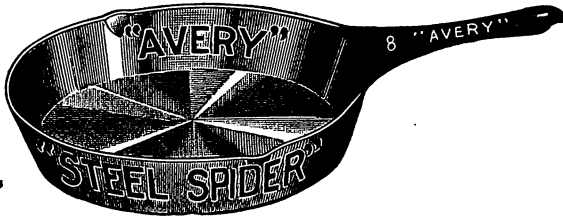
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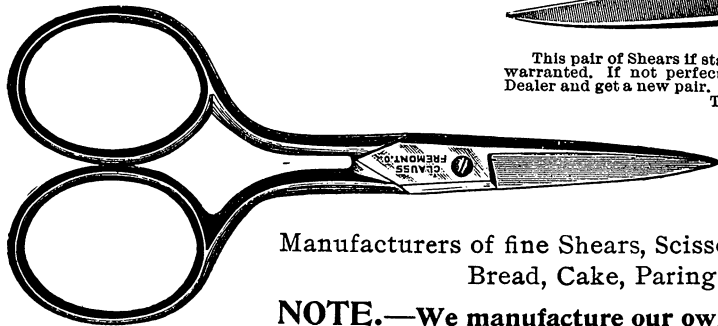


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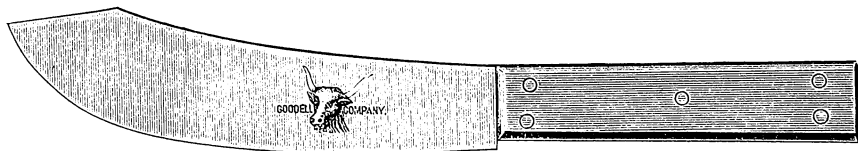
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OUR STEER HEAD BRAND

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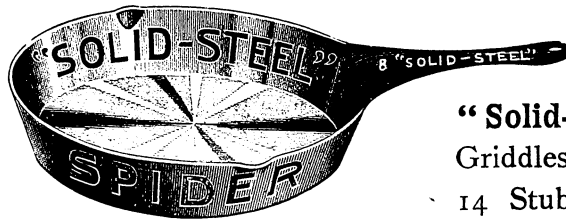
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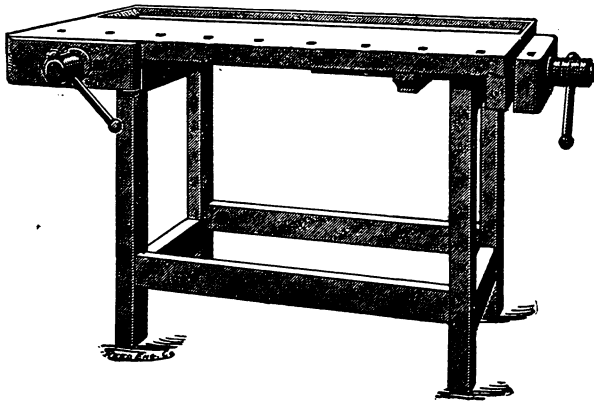
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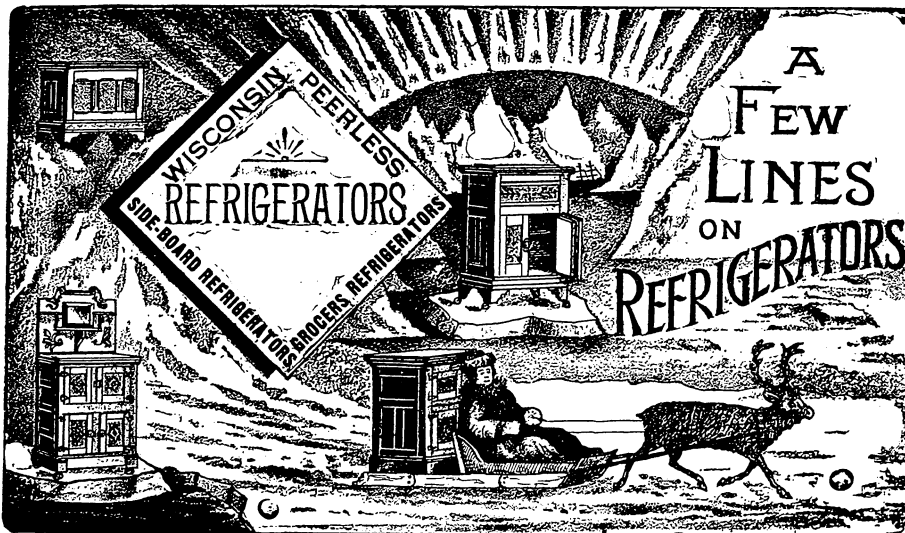
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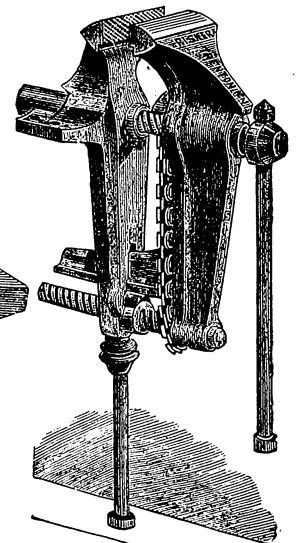
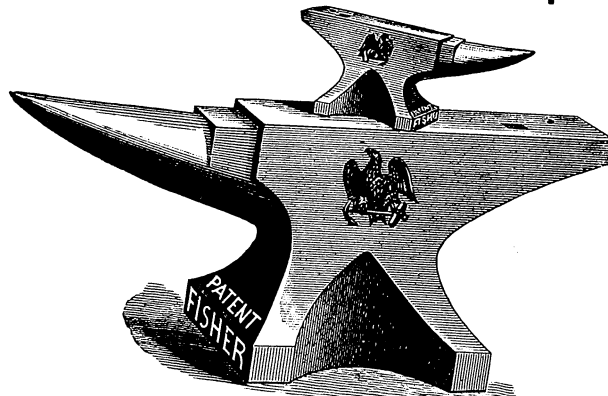
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SHINGLE BACK CURRY COMBS,

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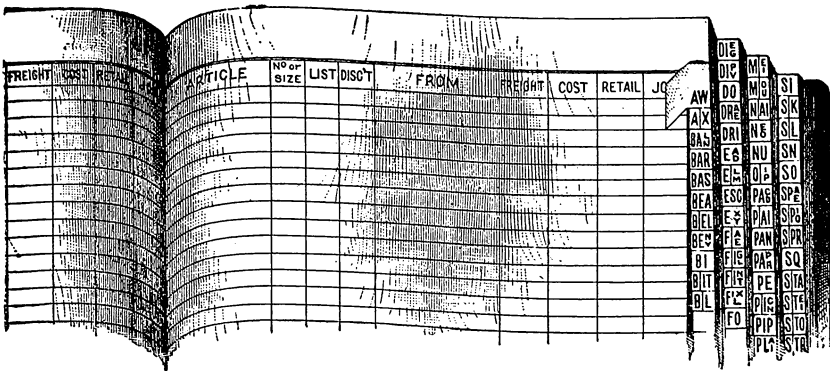
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Send for Our Handsome Catalogue.



The Iron Age Hardware Price Book F.

WITH MULTIPLE INDEX (Patent Pending).



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AN	DI ^V	M ^Q	SK
AU	DO	NAI	SL
AW	DR ^E	N ^O	SN
AX	DRI	NU	SO
BAN	E ^A	O ^P	SP ^E
BAR	E ^M	PA ^S	SP ^O
BAS	ESC	PAI	SPR

Fac-Simile of Indexing.

SIZE.—The book is 8 1/4 x 11 inches (much larger than Price Books A, B, C, D or E), 556 pages.
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INDEX.—By means of the arrangement shown in the cut the four rows of index applies to every page (except Supplement) and permits reference to any article at a single motion. This greatly facilitates the use of the book, avoiding the troublesome turning from page to page which is necessary in connection with other Price Books. It has been prepared with great care, and it is believed that it provides a place for every article in the Hardware line, and gives ample space for recording prices.
Sufficient space has been provided for large lines of goods such as Axes, Bits, Springs, etc., by allowing four pages to such indices, instead of two pages, as for lines of goods requiring less space. This is accomplished, as in AX for example, in Book F by having a short tab with the letter A on the tab on the first leaf, and AX on the tab on the second leaf. The A on the first leaf is directly over the A on the lower leaf, so that the index reads AX whether looking at both leaves together, or at the lower one only.
The four rows of index tabs are printed in gold letters on black Russia leather. The tabs are securely fastened on both sides of each page, making a handsome and durable index.
ARRANGEMENT.—The book is arranged to keep a complete record of prices on a single page, the width giving sufficient room.
SUPPLEMENT.—An 80-page Supplement is provided to give room for supplemental quotations, memoranda, tables, &c.

THIS BOOK IS ISSUED IN ONLY ONE EDITION, PRICE, \$7.50.

Advantages of Multiple Index Price Book.

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For Augers,	turn to	AU	For Chisels,	turn to	CH ^U	For Iron,	turn to	IRO
" Parers, Apple	"	PA ^R	" Cutlery,	"	CUT	" Irons,	"	IR'S
" Saws,	"	SAW	" Cartridges,	"	CAR	" Shovels,	"	SH ^O
" Pumps,	"	PUM ^N	" Rules,	"	RU ^L	" Grindstones,	"	GRI
" Bits,	"	BIT	" Locks,	"	LO	" Stones,	"	STO

Special care has been taken to make the classification as indicated in the index correct and comprehensive, making provision for all Hardware articles and giving sufficient space for the keeping and recording of prices. It is thought that every strictly Hardware article has its first two or three letters given, thus permitting immediate reference to it by a single motion.

It is, however, obvious if any articles are not directly designated by the index characters, that the index, being alphabetical in its arrangement, indicates the place where quotations on such articles should be recorded. The supplement, however, may be found useful for quotations on any outside goods which the Hardwareman may desire to keep prices on, while at the same time it may be used if necessary for any overflow of matter from the preceding pages, or to contain list prices or other matter relating to goods.

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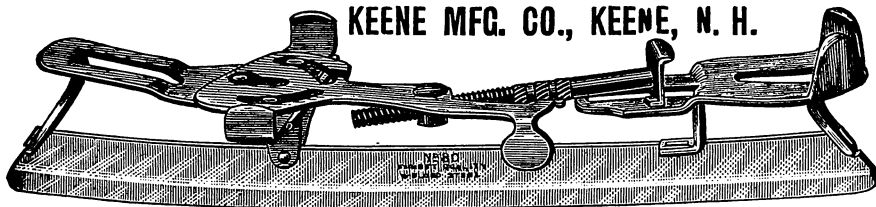
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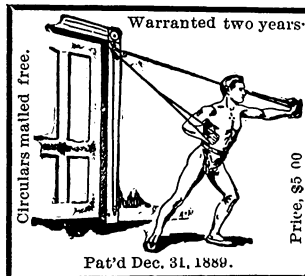
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Are Built to Create Business.
 Are Built to Please Business men
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Grand Rapids Cycle Co.,

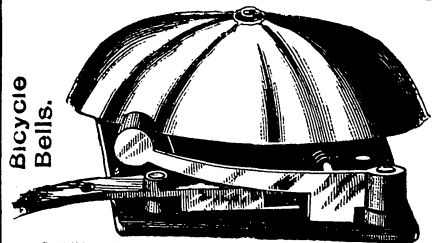
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 Special discount to the Hardware Trade.



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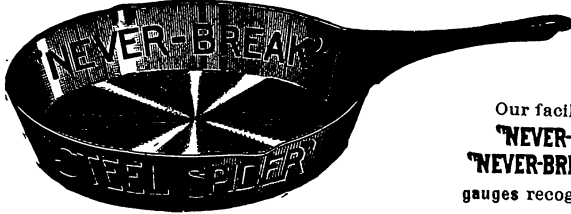
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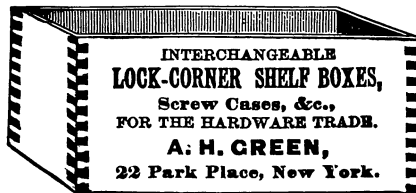
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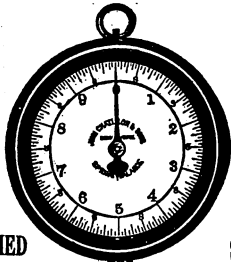
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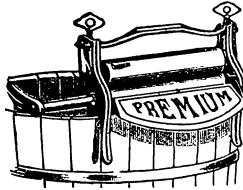


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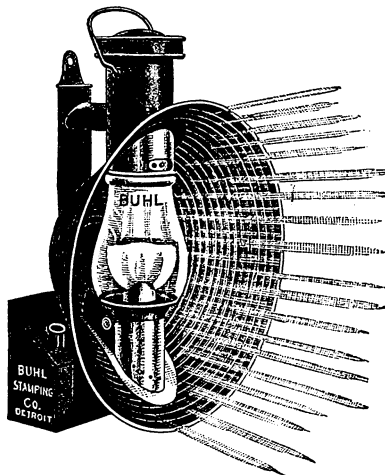
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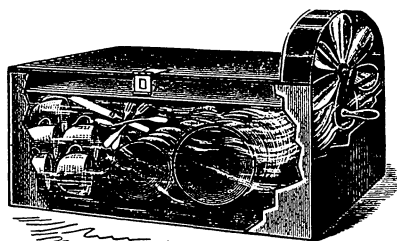
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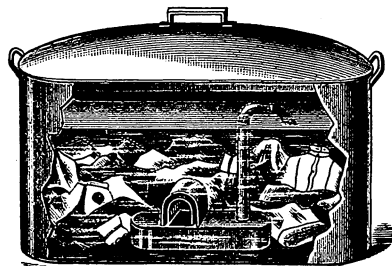
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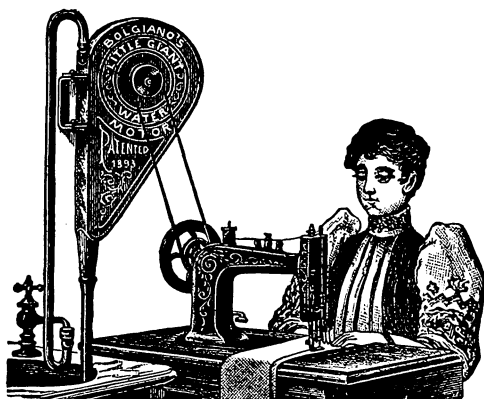
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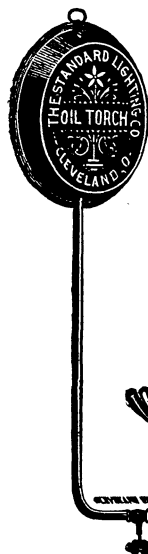
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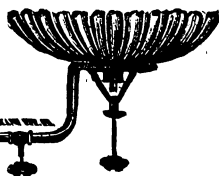


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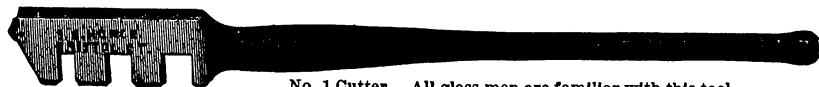
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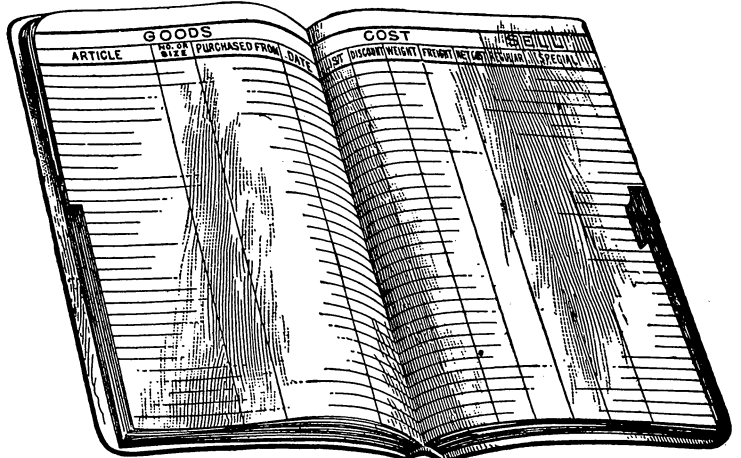
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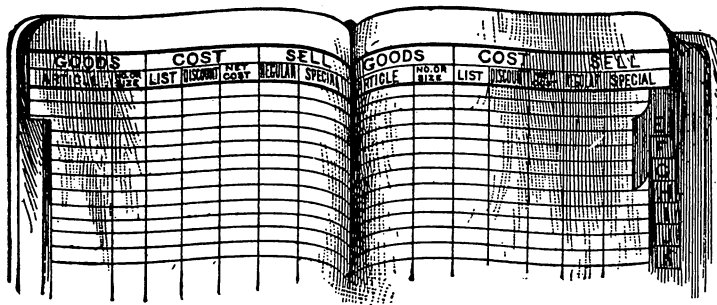
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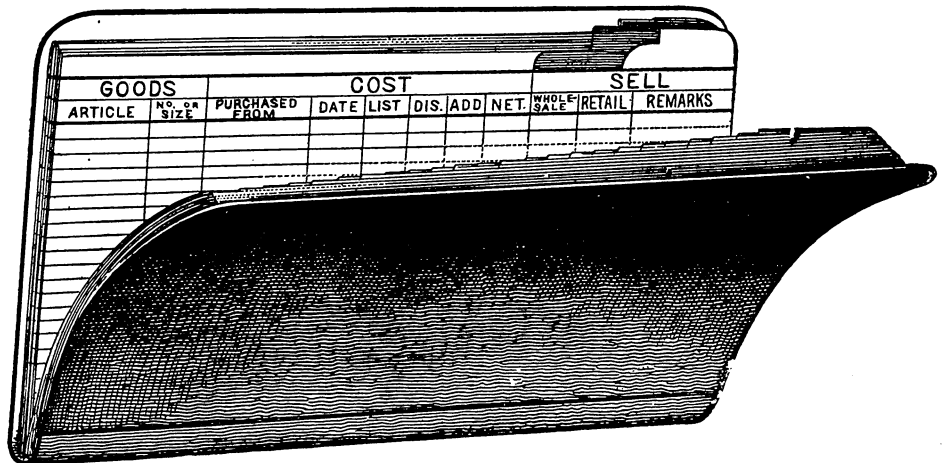
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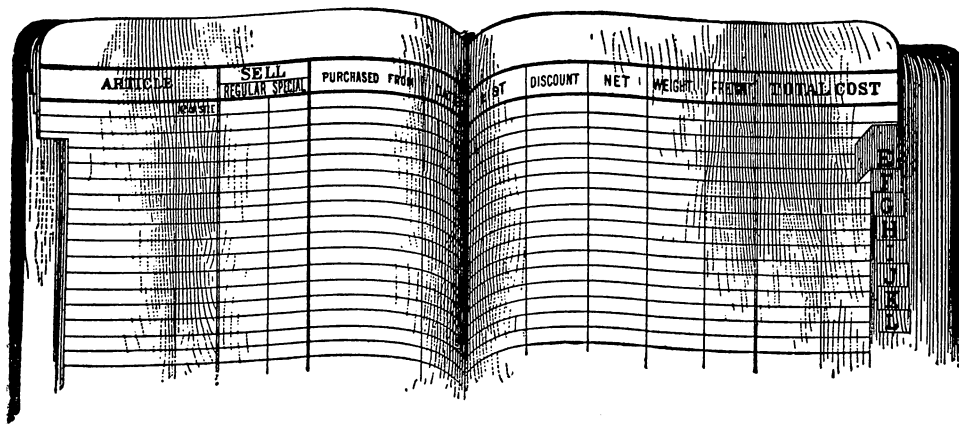
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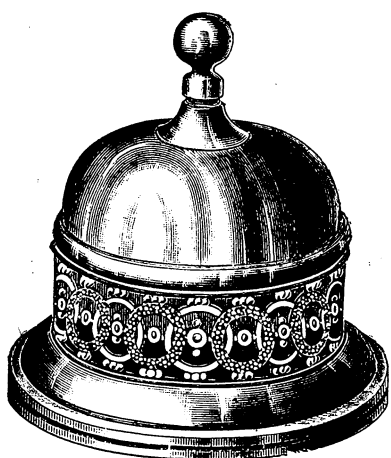
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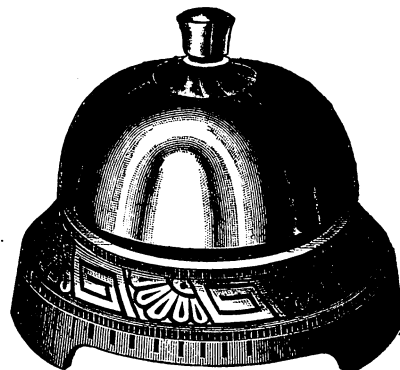
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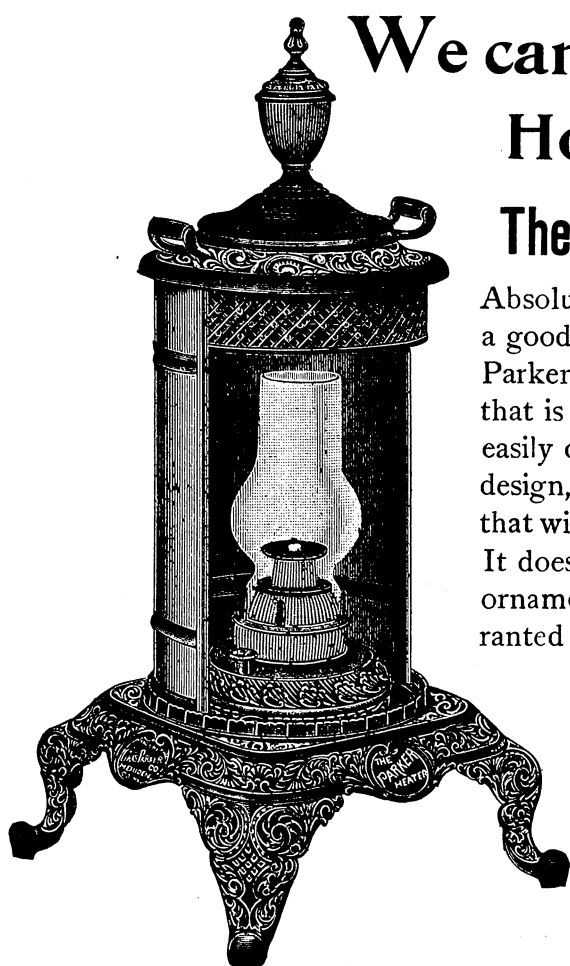


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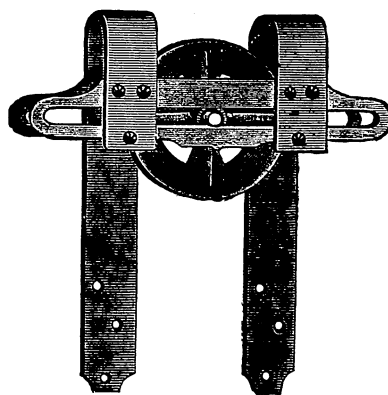
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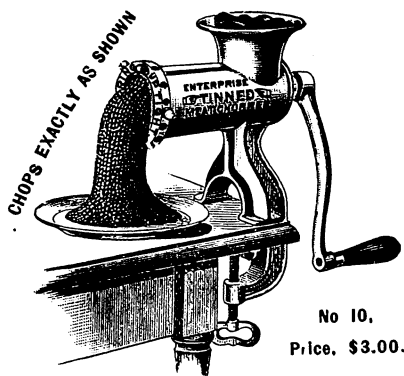
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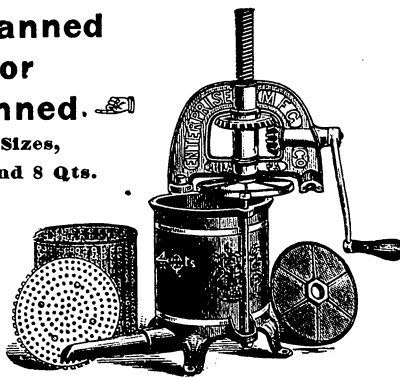
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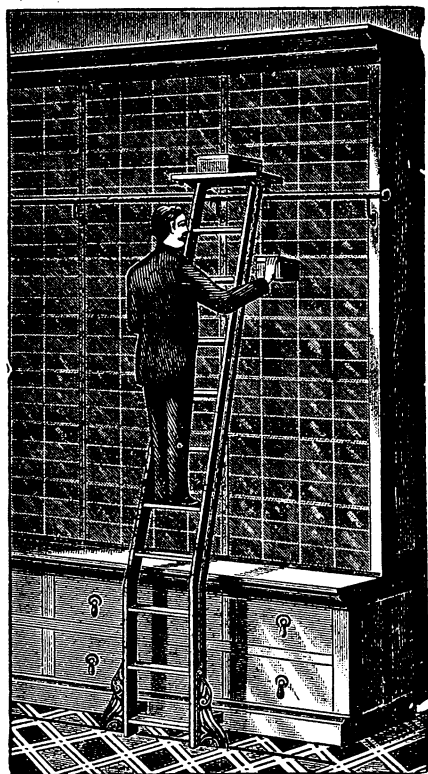
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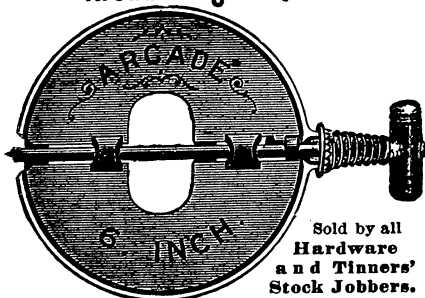
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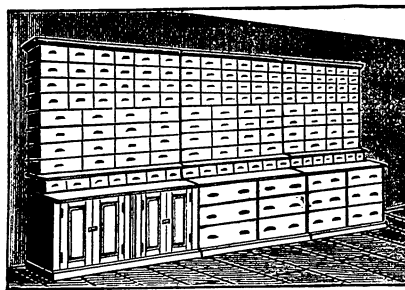
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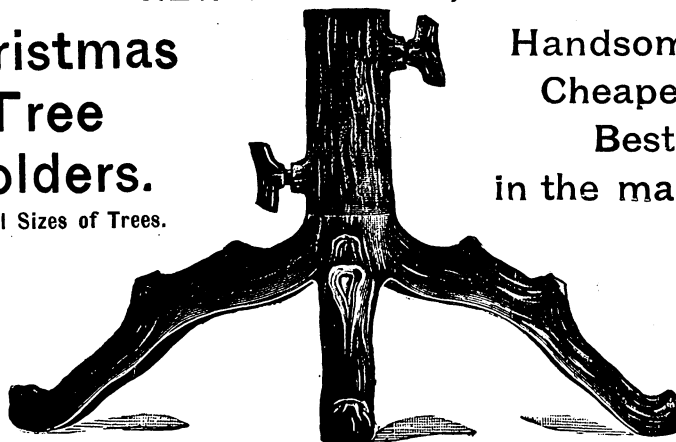
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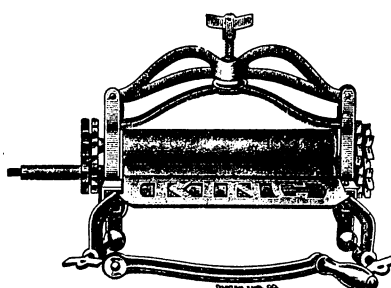
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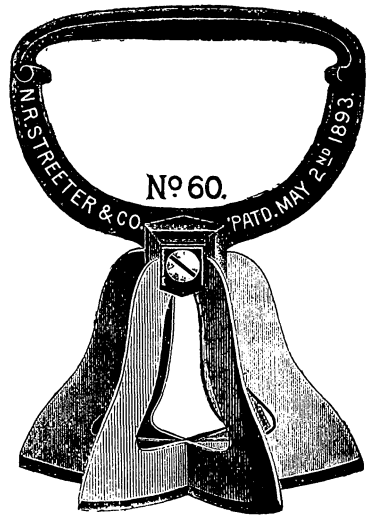
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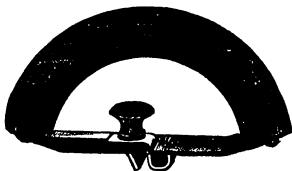
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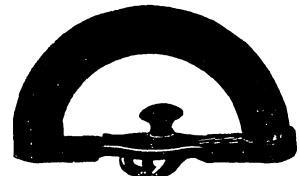
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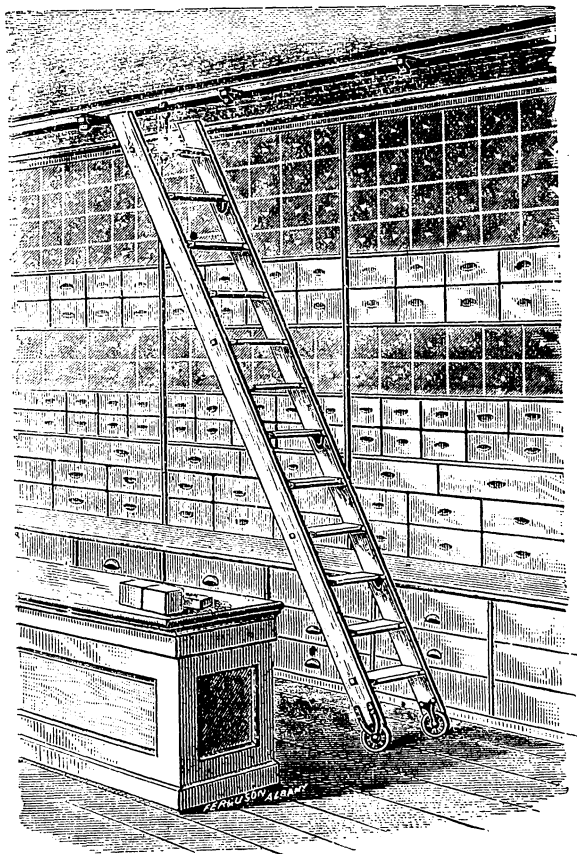
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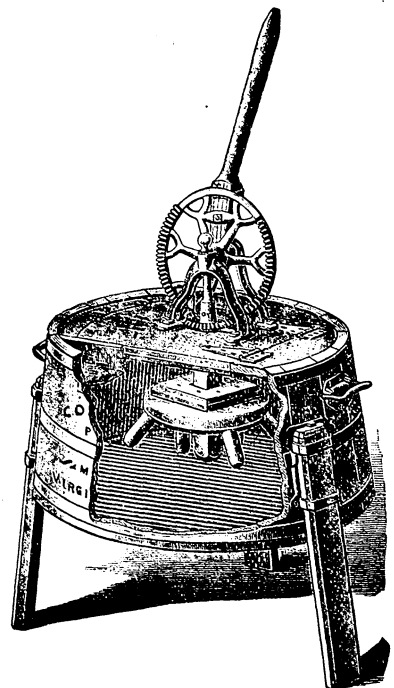
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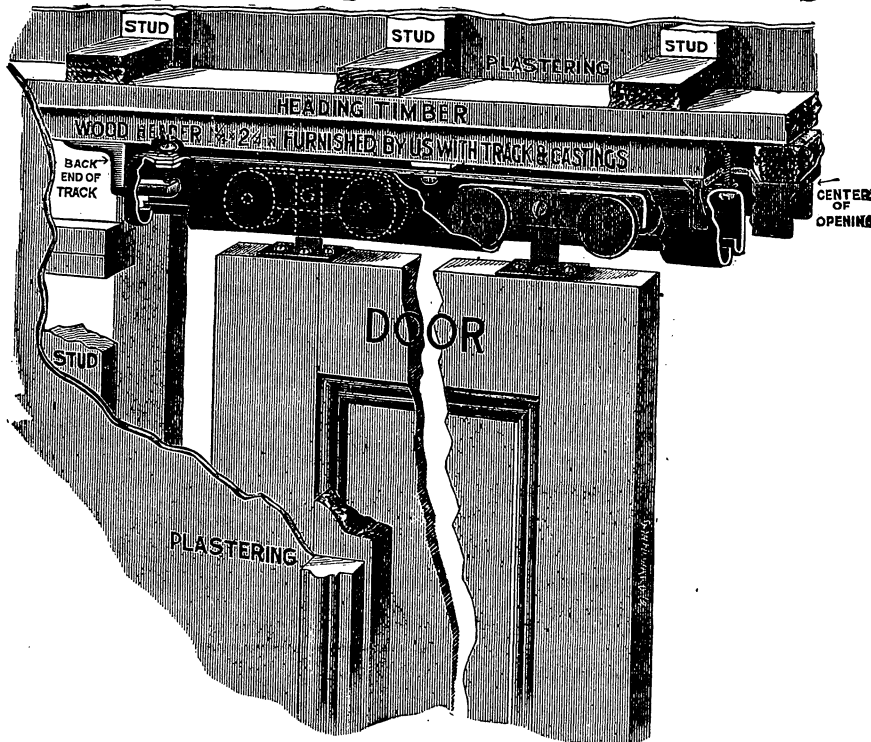


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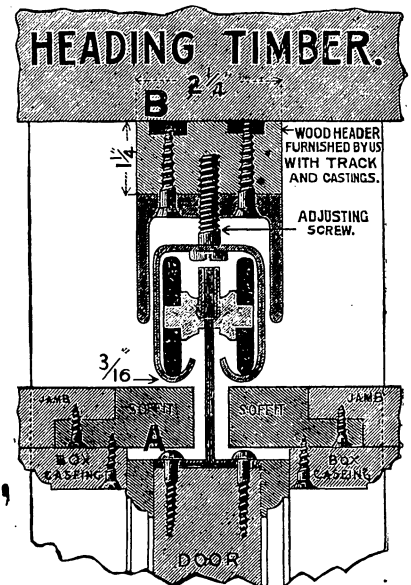
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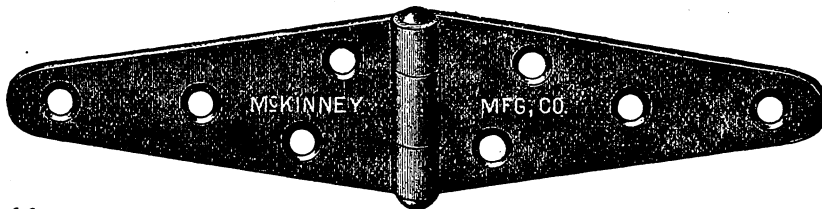
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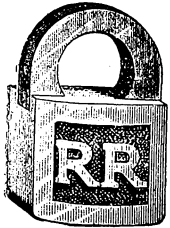
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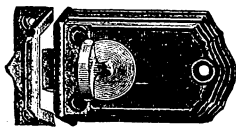
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"NONE BETTER."

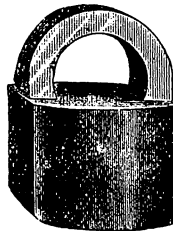


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Washers

Doors hung with these Butts require no oiling,
do not creak, work perfectly.

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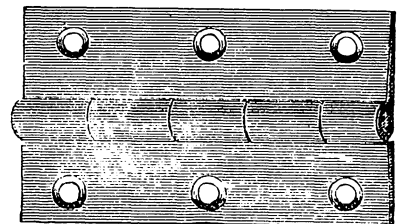
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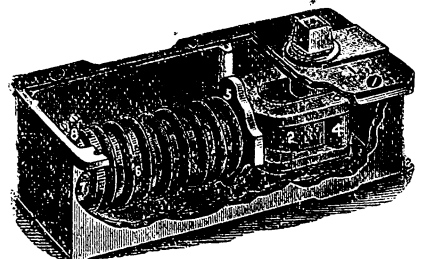
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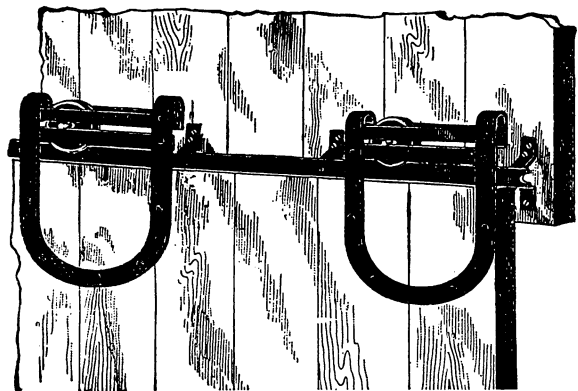
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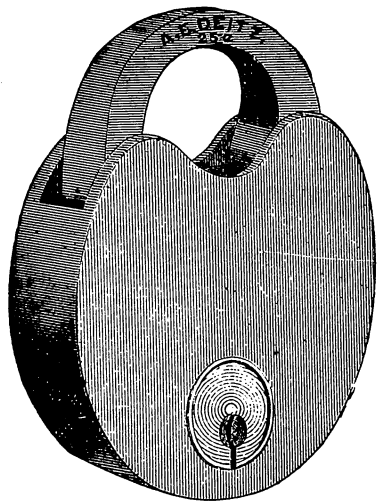
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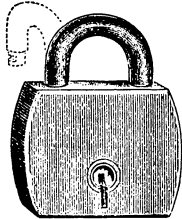
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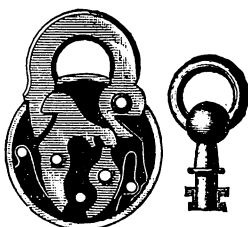


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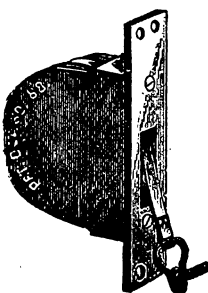
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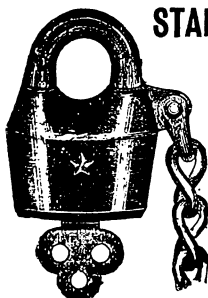
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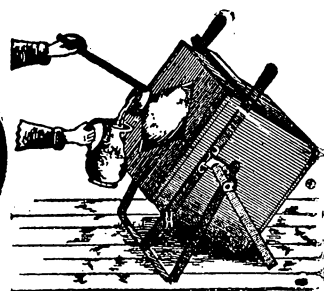
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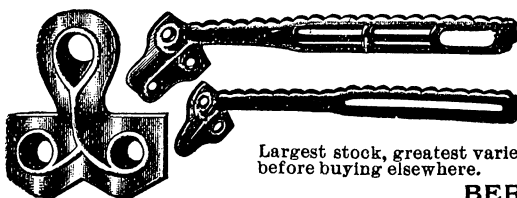
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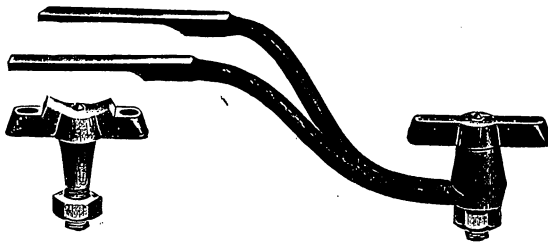


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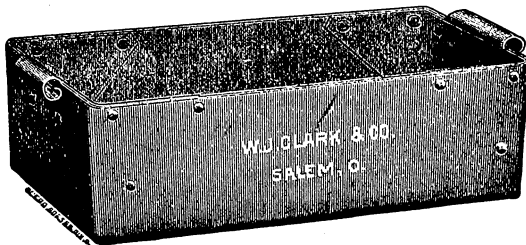
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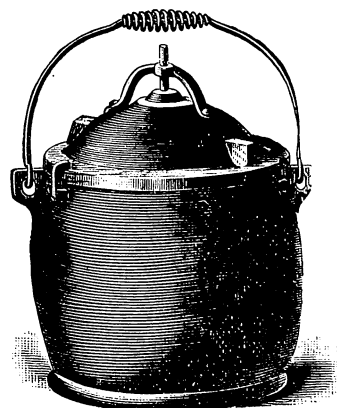
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SOUP DIGESTERS,

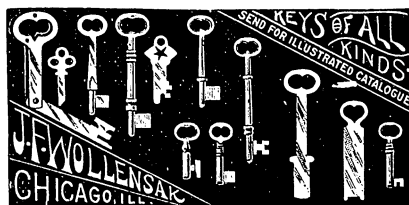
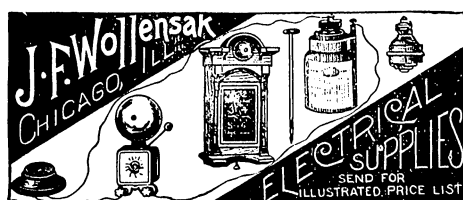
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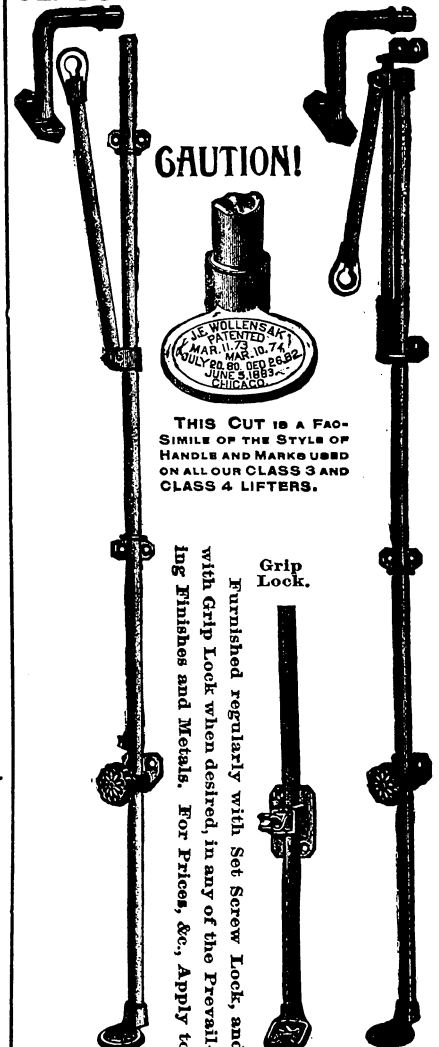
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Furnished regularly with Set Screw Lock, and with Grip Lock when desired, in any of the Prevailing Finishes and Metals. For Prices, &c., Apply to

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**Fine
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JUNIATA STEEL TOE CALKS.

We would also call your attention to our improved Steel Toe Calk, equal to any in the market. To secure the best wearing qualities, use sand or borax in welding on the Calk and cool off at a dark, or still better, cool off without plunging in water.

No. 1, 2, 3, 4, 5 and 6.
Packed in 25 lbs.

Soft Steel Horse.
Shoe Bar, all sizes.

No. 2 EXTRA SWAGED FRONT.

The advantages of these shoes are that, being made of vastly superior material, they will never show signs of red-shortness or cold shortness, will never split in the crease and will always show a much finer finish than any iron shoe.

We make the Steel Shoes lighter than the Iron, giving more shoes to the keg, as follows :

No. 1, 15 more shoes to the keg.

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" 2, 14 "

" " " "

" 4, 8 "

" " " "

And other sizes in proportion.

We also beg to say that we have introduced improved machinery into our new factory and have doubled our capacity, and are now prepared to furnish the best shoe, either iron or steel, ever offered to the trade.

Write to us for information and prices, or apply to jobbers and dealers, who sell them everywhere.

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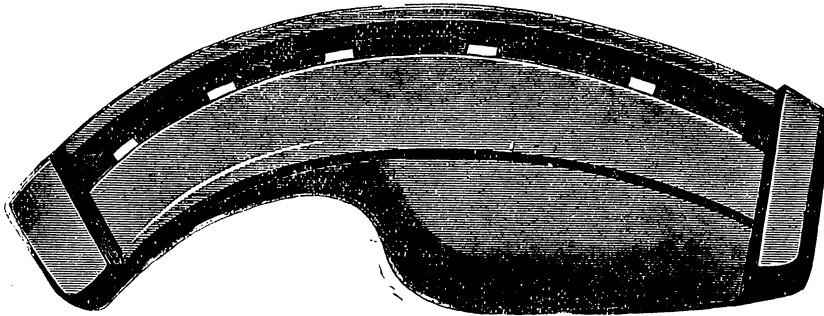
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CARRIAGE HARDWARE AND SPECIAL DROP FORGINGS.

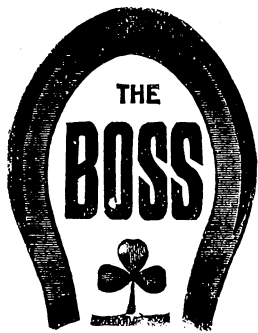
FORGED
OX
SHOES.



Made under Deeble's Patent, Aug. 9, 1887.

Our 1891 pattern is a modification of the style we have made for the past four years, giving additional strength to the web.

IT IS JUST RIGHT.



HORSE AND MULE SHOES.

Superior Quality, Shape and Finish.

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Beautiful Shape.

HORSE SHOES,

Light, Medium and Heavy.

MULE SHOES,

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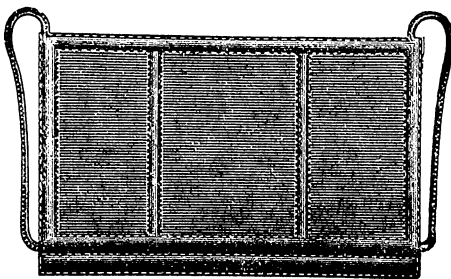
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HOT-FORGED AND HAMMER-POINTED

HORSESHOE NAILS.



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MANUFACTURERS OF THE BEST QUALITY

CARRIAGE MAKERS' HARDWARE,

MANUFACTURE THE LARGEST VARIETY OF

FORGED CARRIAGE IRONS

Of Best Material and Workmanship.

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With Steel Screws. U. S. Standard and the points hardened.



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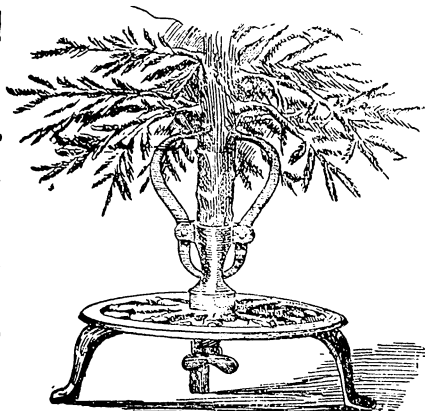
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BUY THE BEST.

Christmas comes but once a year

If you want to make your home pleasant and cheerful during the holidays BUY A MERK CHRISTMAS TREE HOLDER. Made of iron, neatly finished in gold bronze or japanned, a great improvement over any heretofore made. By an ingenious contrivance the tree is held secure by strong arms which extend upward from the main body of the receptacle in which it is placed. If desired the tree can be revolved. Sample tree holders sent by express prepaid upon receipt of \$1. Packed in quarter and half dozen crates for shipment. Manufactured and sold only by the ALLENTOWN HARDWARE WORKS, ALLENTOWN, PA.

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Successors to
Manufacturer of
PATENT STEEL
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TOE-CALKS.
—ALSO—
BURKE'S IMPROVED
HORSESHOERS'
FOOT VICE.
Send for Circulars.
360 Dorchester Av. Dis for Welding
BOSTON, MASS. Sharp Calks.

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Horse and Mule Shoes,

BAR IRON.

CRESCENT HORSE SHOE
IRON CO.

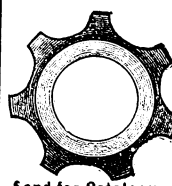
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Carriage Forgings

Of every description. Also Special Forgings.

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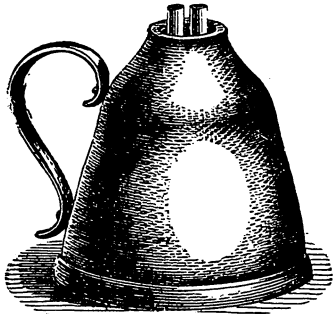
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NEW pattern Heavy Screw Clamps
strongest in the Market.

For sale by all the principal Hardware Dealers.

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Of superior quality, and Hardware Specialties
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IMPROVED MINE LAMP
FOR ANTHRACITE AND
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SEAMLESS
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BRASS HINGE
Lid Solid
No Soldering

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DIFFERENT
STYLES
OF SPOUTS.

SAMPLE 15¢.

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CAN RECOMMEND THE

**CHAMPION METAL WINDOW
SASH CHAINS**

to their customers as a reliable substitute for
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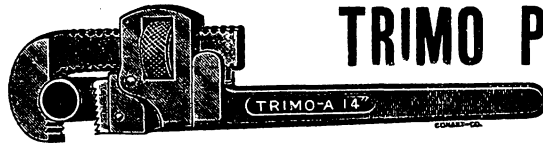
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Improved Adjustable S-Wrench.
Case-Hardened Throughout. Parts Interchangeable.

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All Parts Interchangeable.

Grips firmly without loss of motion. Releases readily. Never locks. Causes no
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The chain holds securely;
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Interchangeable gripping jaws.

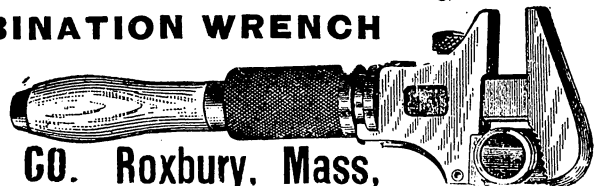


TRIMO GIANT WRENCH.

Strongest and safest Pipe Wrench ever
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**TRIMO COMBINATION WRENCH
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Billings' Patent Cutting-Off Tool.



The Holder is drop-forged, of steel, and finished in a thorough
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"OHIO" LEVER CUTTER

1894 PATTERN. PRICE \$5.00.

Simple, Durable,

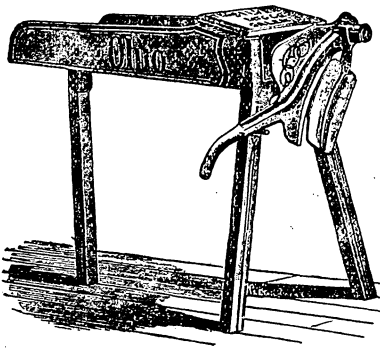
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It has an eleven-inch Oil-Tempered Sickle Knife
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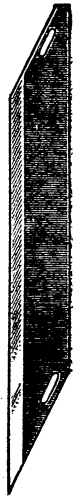
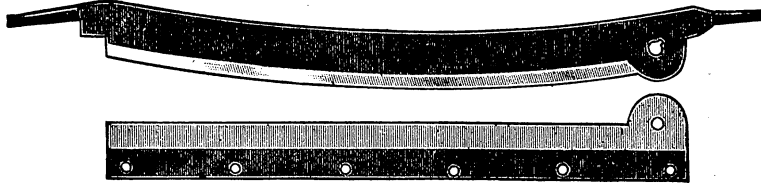
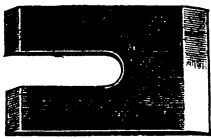
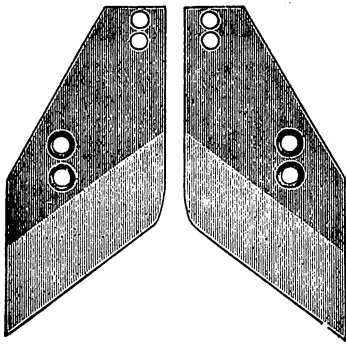


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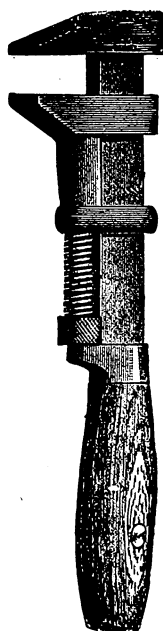
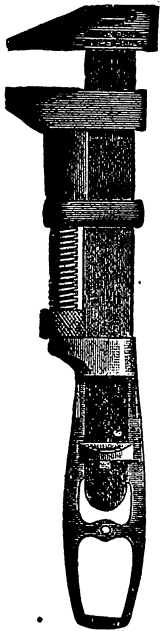


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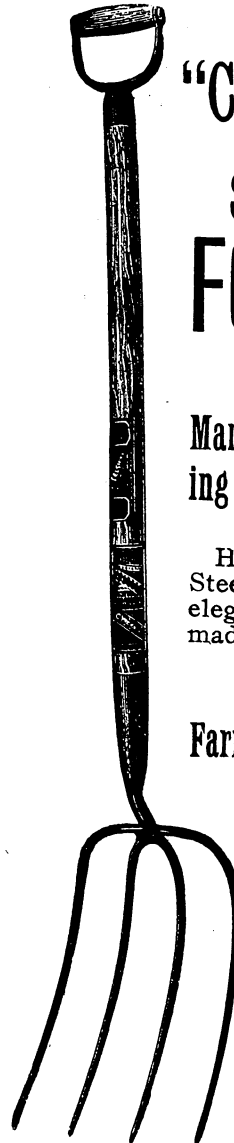
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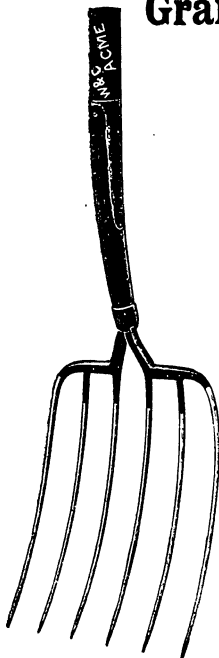
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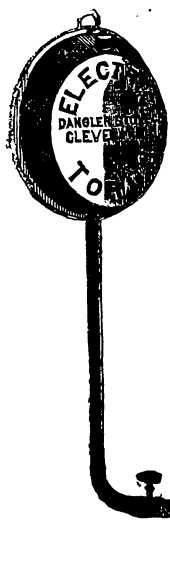


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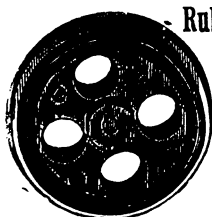
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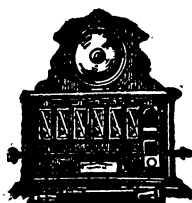


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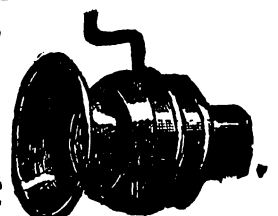


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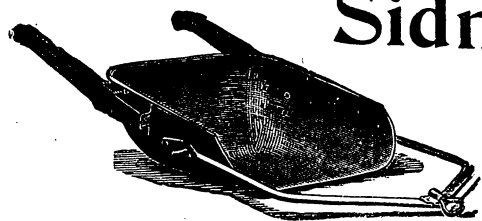
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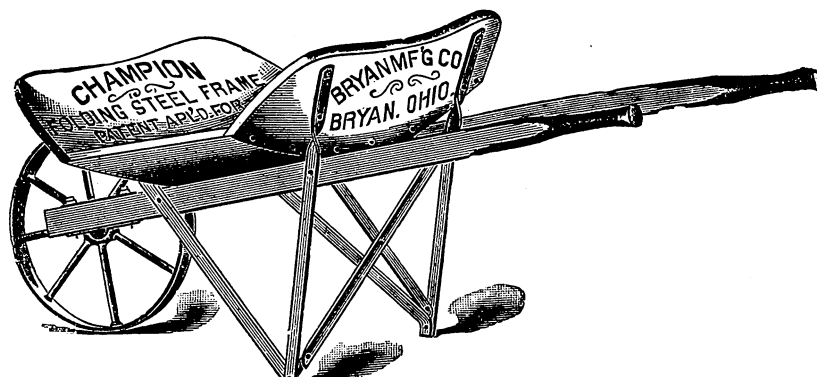
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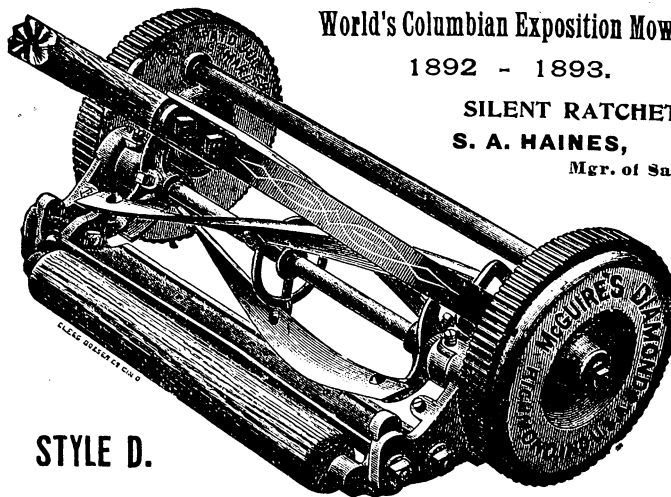
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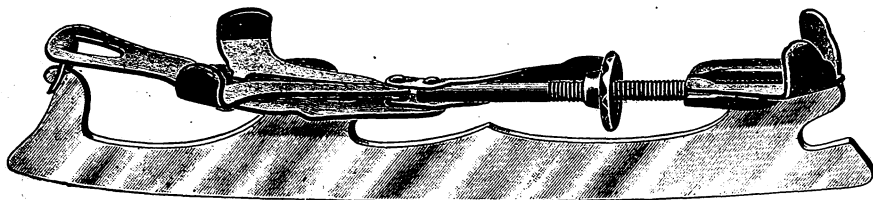
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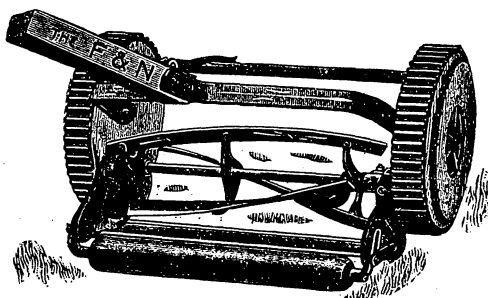


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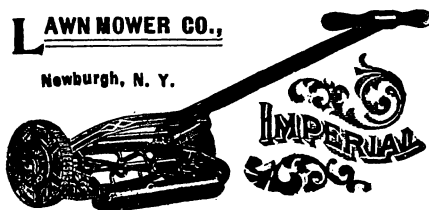
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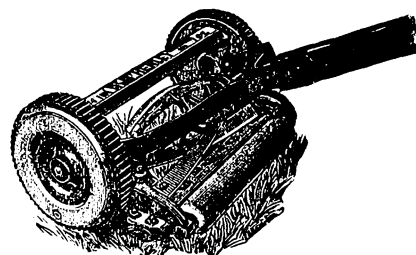
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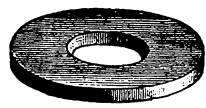
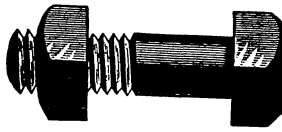

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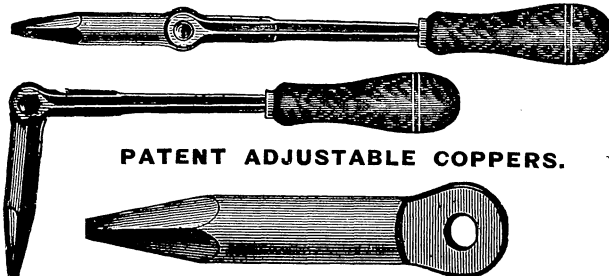
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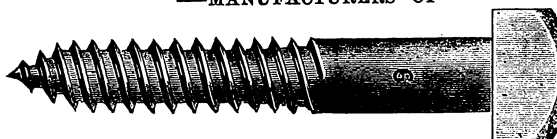
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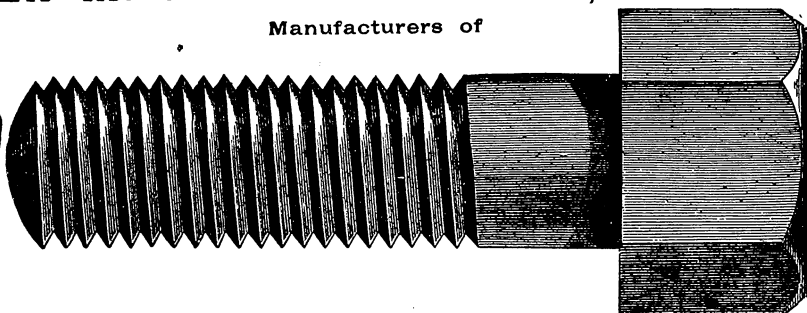
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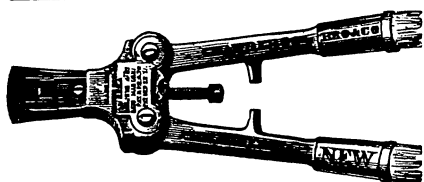
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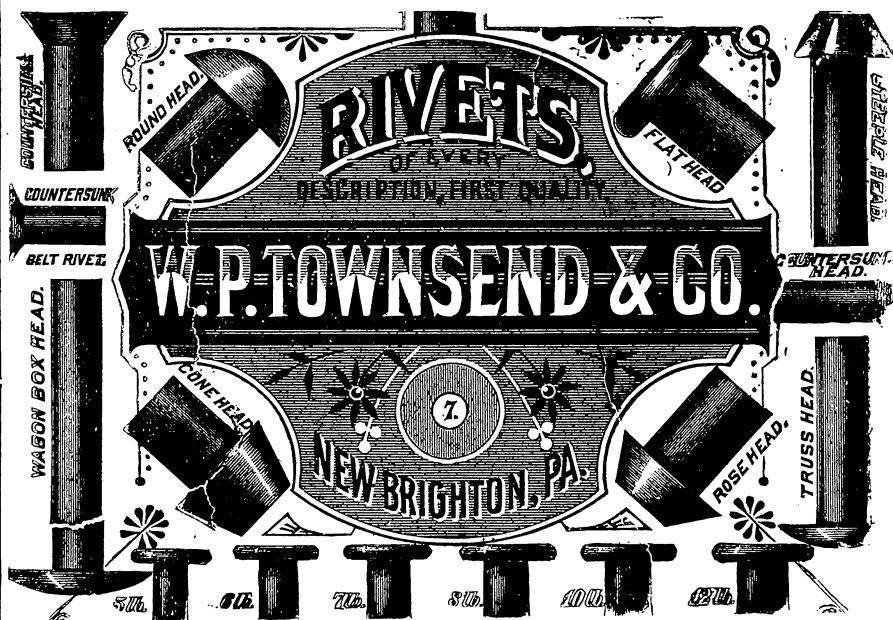
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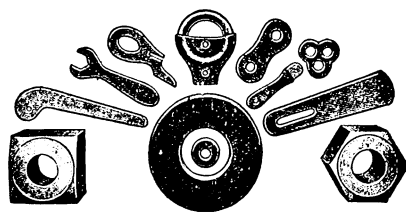
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Amidon Tool Corp., Buffalo, N. Y.

Blocks, Tackle, Makers of.

Cleveland Block Co., Cleveland, O.
Fulton Iron & Engine Works, Detroit, Mich.

Blowers.

Buffalo Forge Co., Buffalo, N. Y.
Champion Blower & Forge Co., Lancaster, Pa.
Sturtevant, B. F. & Co., Boston, Mass.

Boats, Sporting.

American Rubber Boat Co., N. Y.

Boiler Plates.

Carbon Steel Co., Pittsburgh, Pa.
McIlvain, Wm. & Sons, Reading, Pa.
Lukens Iron & Steel Co., Coatesville, Pa.
Pottstown Iron Co., Pottstown, Pa.

Boilers, Copper.

Randolph & Clowes, Waterbury, Conn.

Boilers, Steam.

Babcock & Wilcox Co., 30 Cortlandt.
Collins, H. E. & Co., Pittsburgh, Pa.
Harrison Safety Boiler Wks., Phila., Pa.
Pollock, W. B. & Co., Youngstown, O.
Porter, H. K., Boston, Mass.
Southwark Pdy. & Mch. Co., Phila., Pa.
Sterling Co., Chicago, Ill.
Wetherill, Robt. & Co., Chester, Pa.

Bolt Cutters.

Chambers Bros. Co., Philadelphia.
Howard Iron Works, Buffalo, N. Y.
Wells Bros. & Co., Greenfield, Mass.

Books.

Republic Press, 14 Lafayette Place, N. Y.
Williams, David, 96-102 Reade, N. Y.

Boring Machines.

Buckeye Mfg. Co., Union City, Ind.

Box Banders.

Goodell, J. W., Burlington, Vt.

Boxes, Hdw. Shell, &c.

Green, A. H., 22 Park Place, N. Y.
Jones, Jesse & Co., Philadelphia, Pa.

Brass, Manufacturers of.

Ansonia Brass & Copper Co., N. Y.
Davol, John & Sons, 100 John, N. Y.
Plume & Atwood Mfg. Co., N. Y.
Randolph & Clowes, Waterbury, Conn.
Some Brass & Copper Co., Rome, N. Y.
Scovill Mfg. Co., Waterbury, Conn.
Waterbury Brass Co., 296 B'way, N. Y.

Brass Butt Hinges.

Tiebout, W. & J., 16 & 18 Chambers.

Brass Founders.

Cramp, Wm. & Sons S. & E. B. Co., Philadelphia, Pa.
Eynon-Evans Mfg. Co., Philadelphia, Pa.
Fram, E. T., Lancaster, Pa.
Haight & Clark, Albany, N. Y.
Keys, W. W. & R. M. Co., Bridgeport, Conn.
North Bros. Mfg. Co., Phila., Pa.
Reeves, Paul S., Philadelphia.

Brass Goods.

Brass Goods Mfg. Co., 88 Chambers.

Bread and Cake Knives.

Clauss Shear Co., Fremont, O.

Bridge Builders.

Berlin Iron Bridge Co., East Berlin, Ct.

Bronze (Tobin).

Ansonia Bronze & Copper Co., 19-21 Cliff Street, N. Y.
Bridgeport Deoxidized Bronze & Metal Co., Bridgeport, Conn.

Brooms and Brushes.

Rice Mfg. Co., New Durham, N. H.

Builders' Hardware.

Deltz, A. E., 87 Chambers St., N. Y.
Reading Hdw. Co., Reading, Pa.
South, W. A. Co., Salem, Mass.
Yale & Towne Mfg. Co., Stamford, Ct.

Burr Wheels.

Torrance Iron Co., Troy, N. Y.

Butchers' Steels.

Chatillon, John & Sons, 85-89 Cliff St., N. Y.

Butcher and Shoe Knives, Manufacturers of.

Chatillon, John & Sons, 85-89 Cliff St., N. Y.
Goodell Co., Antrim, N. H.
Wilson, John, Sheffield, England.

Butts and Hinges.

McKinney Mfg. Co., Allegheny, Pa.
Sabin Machine Co., Montpelier, Vt.

Stanley Works, New Britain, Conn.
Tiebout, W. & J., 16 Chambers, N. Y.
Wrightsville Hdw. Co., Wrightsville, Pa.

Cabinet Benches.

Grand Rapids Hand Screw Co., Grand Rapids, Mich.

Calipers and Dividers.

J. Stevens Arms and Tool Co., Chicopee Falls, Mass.
Starrett, L. S., Athol, Mass.

Car Axles.

Roberts, A. & P. & Co., Phila.

Carboy Stands.

Wolf, W. & L., Philadelphia, Pa.

Carriage Hardware, Makers of.

Clapp, E. D. Mfg. Co., Auburn, N. Y.
Covert's Saddlery Works, Farmer, N. Y.
Eccles, Richard, Auburn, N. Y.
Cincinnati Dash & Hdw. Co., Ltd., Buffalo, N. Y.
Scranton Forging Co., Scranton, Pa.
Smith, H. D. & Co., Plantsville, Conn.
Wilcox & Howe, Birmingham, Conn.

Cartridge Reloading Tools.

Ideal Mfg. Co., New Haven, Conn.

Carvers' Tools.

White, Van Glahn & Co., 15-17 Chatham Square, N. Y.

Casters, Wheel, &c.

Clark G. P., Windsor Locks, Conn.

Castings, Iron and Steel.

Allentown Hdw. Wks., Allentown, Pa.
Booth, The Lloyd Co., Youngstown, O.
Boston Casting Co., So. Boston, Mass.
The Burr & Houston Co., Brooklyn, N. Y.

Cheney, S. & Son, Manlius, N. Y.
Chester Steel Casting Co., Phila.
Chrome Steel Works, Brooklyn, N. Y.
Eureka Cast Steel Co., Chester, Pa.
Flagg, Stanley G. & Co., Phila.
Garland Foundry Co., Cleveland, O.
Haight & Clark, Albany, N. Y.
Palmer & De Mooy Fdry. Co., Cleveland, O.
Parsons, R. E. Co., Bridgeport, Conn.
Pratt & Cady Co., Hartford, Conn.
Sessions Foundry Co., Bristol, Conn.
Shickle, Harrison & Howard Iron Co., St. Louis, Mo.

Spencer's I. S. Sons, Guilford, Conn.
Standard Fr. & Mfg. Co., Cleveland, O.
Torrance Iron Co., Troy, N. Y.
Union Lock & Hdw. Co., Lancaster, Pa.
Walker Mfg. Co., Cleveland, Ohio.
Wetherill, Robert & Co., Chester, Pa.
Wilcox, Crittenden & Co., Middletown, Conn.

Castings, Malleable.

Arcade Malleable Iron Co., Worcester, Mass.
Hammer & Co., Branford, Conn.
Torrance Iron Co., Troy, N. Y.

Catalogue Files.

Folding Paper Box Co., So. Bend, Ind.

Chains.

Bradley & Co., Philadelphia.
Garland Chain Co., Rankin, Pa.
Link Belt Engineering Co., Phila., Pa.
McKay, Jas. & Co., Pittsburgh, Pa.

Check Punch.

Hagenson & Pettis Mfg. Co., New Haven, Conn.

Chimneys.

Phil. Engineering Works, Phila., Pa.

Chisels, Manufacturers of.

Buck Bros., Milbury, Mass.

Buck, Chas., Milbury, Mass.

White, L. & I. J. Co., Buffalo, N. Y.

Chucks.

Cushman Chuck Co., Hartford, Conn.
Leavitt Mch. Co., Orange, Mass.

Skinner Chuck Co., New Britain, Conn.

Smith & Egge Mfg. Co., Bridgeport, Conn.

Union Mfg. Co., 103 Chambers, N. Y.

Whitton, D. E. Mach. Co., New London, Conn.

Clamps.

Hamm & Co., Branford, Conn.

Le Count, C. W., So. Norwalk, Conn.

Clipping Machines.

Gillette Clipping Machine Co., 201 E. 23d Street, N. Y.

Coal.

Barns, C. K. & Co., Philadelphia, Pa.

Wister, Francis, Philadelphia, Pa.

Coat and Hat Hooks.

Am. Wire Goods Co., Lowe 1, Mass.

Coffee Mills.

Enterprise Mfg. Co., Phila., Pa.

Coke.

Barns, C. K. & Co., Philadelphia, Pa.
Houston, C. B. & Co., Philadelphia, Pa.
Rainer, W. J., Cleveland, O.
Wister, Francis, Philadelphia, Pa.

Collections.

Hardware Board of Trade (Limited), 4 and 6 Warren, N. Y.

Condensers.

Worthington, Henry R., 86 & 88 Liberty Street, N. Y.

Conveying Machinery.

Brown Hoisting & Conveying Machine Co., Cleveland, Ohio.
Jeffrey Mfg. Co., Columbus, O.
Link-Belt Engineering Co., Phila., Pa.

Copper.

Anes Sword Co., Chicopee, Mass.
Ansonia Brass & Copper Co., 19 and 21 Cliff, N. Y.
Hendricks Bros., 49 Cliff, N. Y.
New Haven Copper Co., 294 Pearl, N. Y.
Randolph & Clowes, Waterbury, Conn.
Rome Brass & Copper Co., Rome, N. Y.
Wister, Francis, Philadelphia, Pa.

Copper, Sheet.

Cramp Metal Mfg. Co., Olney, Phila., Pa.

Cordage.

Samson Cordage Works, Boston, Mass.

Cork Screws.

Williamson, C. T. Wire Novelty Co., Newark, N. J.

Corrugated Furnaces.

Continental Iron Wks., Brooklyn, N. Y.

Corrugated Iron.

Cincinnati Corrugating Co., Piqua, O.
Jersey City Galvanizing Co., 112 John St., N. Y.
Moseley Iron Bridge & Roof Co., 5 Dey, N. Y.
N. Y. Iron Roofing & Corrugating Co., Jersey City, N. J.

Counting Machines.

Durant, W. N., Milwaukee, Wis.

Cranes.

Maris & Beekley, Philadelphia, Pa.
Ridgway, Craig & Sons, Coatesville, Pa.

Sellers, Wm. & Co., Inc., Phila., Pa.
Whiting Foundry Equipment Co., Chicago, Ill.

Yale & Towne Mfg. Co., Stamford, Conn.

Culverts.

Nichols, W. A., Philadelphia, Pa.

Cupolas, Hot Blast.

Byram & Co., Detroit, Mich.

Whiting Foundry Equipment Co., Chicago, Ill.

Curry Combs.

N. Y. Stamping Co., Brooklyn, N. Y.

Cutlery, Importers of.

Sickles, Sweet & Lyon, 35 Barclay, N. Y.

Cutlery, Manufacturers of.

Bingham, W. Co., Cleveland, Ohio.
Dane, Stoddard & Kendall, Boston, Mass.
Goodell Co., Antrim, N. H.
Northampton Cutlery Co., Northampton, Mass.
Wilson, John, Sheffield, England.

Cutlery Display Cases.

Union Show Case Co., Chicago, Ill.

Dampers.

Arcade Mfg. Co., Freeport, Ill.

Dashes and Fenders.

McKinnon Dash & Hdw. Co., Ltd., Buffalo, N. Y.

Dies.

Wilson, J. Fred, Worcester, Mass.

Die Forgings and Castings.

Bliss, E. W. Co., Brooklyn, N. Y.

Dish Washers.

Bolgiano Mfg. Co., Baltimore, Md.

Door Checks and Springs.

Bardsley, J., 149 & 151 Baxter St., N. Y.
Blount Mfg. Co., Boston, Mass.

Drilling Machines.

Beaman & Smith, Providence, R. I.
Bickford Drill & Tool Co., Cin., Ohio.
Buffalo Forge Co., Buffalo, N. Y.
Champion Blower & Forge Co., Lancaster, Pa.

Dallett, Thos. H. & Co., Philadelphia.
D'Amour & Littledale 204 E. 43d St., N. Y.
Dietz, Schumacher & Co., Cincinnati, Ohio.

Dwight Slate Machine Co., Hartford, Conn.
Goddard, Asa, Worcester, Mass.

Halsey, Jas. T., Philadelphia, Pa.
Hamilton Mch. Tool Co., Hamilton, O.
Quint, A. D., Hartford, Conn.

Sellers, Wm. & Co., Inc., Phila., Pa.
Sigmeyer Tool Co., Hartford, Conn.
Silver Mfg. Co., Salem, O.

Wiley & Russell Mfg. Co., Green

Egg Beaters.

North Bros. Mfg. Co., Philadelphia, Pa.

Electric Bells and Supplies.

Ostrander, W. R. & Co., 304 Fulton St., New York.
Wollensak, J. F., Chicago, Ill.

Electric Lights.

Electric Construction & Supply Co., 18 Cortlandt St., N. Y.

Elevator Buckets.

Clark, W. J. & Co., Salem, O.

Elevators, Makers of.

Link-Belt Engineering Co., Phila., Pa.
Morris, Williams & Co., Phila., Pa.
Penna. Elevator Engineering Co., Phila., Pa.

Emery and Emery Wheels.

Cutter, Wood & Stevens, Boston, Mass.
Diamond Mach. Co., Providence, R. I.
N. Y. Belding & Packing Co., Ltd., N. Y.
Northampton Emery Wheel Co., Leeds, Mass.
Norton Emery Wheel Co., Worcester, Mass.
Sterling Emery Wheel Co., 174 Fulton St., N. Y.
Tanite Co., Stroudsburg, Pa.

Emery Wheel Dressers.

Bay State Stamping Co., Worcester, Mass.

Engineers and Contractors.

Aiken, Henry, Pittsburgh, Pa.
Bierie, J. A., 284 Pearl St., N. Y.
Kennedy, Julian, Pittsburgh, Pa.
Laughlin, Alex. & Co., Pittsburgh, Pa.
Lean, D. R., Co., Pittsburgh, Pa.
McClure, Amaler & Co., Pittsburgh, Pa.
Smythe, S. R. Co., Incorporated, Pittsburgh, Pa.
Swindell, W. & Bros., Pittsburgh, Pa.

Engines, Gas and Gasoline.

Buckeye Mfg. Co., Union City, Ind.
Otto Gas Engine Works, Phila., Pa.
Springfield Gas Engine Co., Springfield, Ohio.

Engines, Steam, Makers of.

Allis, E. P. Co., Milwaukee, Wis.
Bass Foundry & Machine Works, Ft. Wayne, Ind.
Harris, Wm. A., Steam Engine Co., Providence, R. I.
Norwalk Iron Works Co., So. Norwalk, Conn.
Phila. Engineering Works, Phila., Pa.
Southwark Foundry & Machine Co., Phila., Pa.
Tod, William & Co., Youngstown, O.
Totten & Hogg Iron & Steel Fdry. Co., Pittsburgh, Pa.
Westwick, Jno. & Son, Galena, Ill.
Wetherill, Robt. & Co., Chester, Pa.

Excelsior.

Independent Electric Co., Chicago, Ill.

Expansion Bolts.

Boone, W. C. Mfg. Co., Boonton, N. J.
Church, Isaac, Toledo, O.
Steward & Romaine Mfg. Co., Phila., Pa.

Exporters.

Flint & Co., 68 Broad St., N. Y.

Faucets, Self-Measuring.

Lane Bros., Poughkeepsie, N. Y.

Faucets, Wooden, Makers of.

John Sommer's Son, Newark, N. J.

Feed-Water Heaters and Purifiers.

Davis, I. B. & Son, Hartford, Conn.
Harrison Safety Boiler Works, Phila., Pa.
National Pipe Bending Co., New Haven, Conn.
Taunton Locomotive Mfg. Co., Taunton, Mass.
Webster, Warren & Co., Camden, N. J.
Whitlock Coal Pipe Co., Elmwood, Conn.

Fence Ratchets.

Wire Fence Supply Co., Indianapolis, Ind.

Fencing, Iron and Wire.

Barnum, E. T., Detroit, Mich.
California Wire Works, San Francisco, Cal.
Champion Iron Co., Kenton, O.
Chess Bros., Pittsburgh, Pa.
Clinton Wire Cloth Co., Clinton, Mass.
Gilbert & Bennett Mfg. Co., 42 Cliff St., New York.
Kilmer Mfg. Co., Newburgh, N. Y.
The Van Dorn Iron Works Co., Cleveland, O.

Files, Importers of.

Moss, F. W., 80 John St., N. Y.

Files and Rasps, Manufacturers of.

Academy File Works, Anderson, Ind.
Banker & White, Troy, N. Y.
Barnett, G. & H., 41 & 43 Richmond, Phila.
McCaffrey File Co., Philadelphia.
Nicholson File Co., Providence, R. I.

Fire Brick, Makers of.

Borgner, Cyrus, Philadelphia, Pa.
Gardner, Jas. & Son, Cumberland, Md.
Kreischer, B. & Sons, foot E. Houston St., N. Y.
Maurer, H. & Son, 420 E. 23d, N. Y.
Ostrander Fire Brick Co., Troy, N. Y.
Valentine, M. D. & Bro. Co., Woodbridge.

Fire Doors.

Berlin Iron Bridge Co., E. Berlin, Conn.
Coburn Trolley Track Mfg. Co., Holyoke, Mass.

Fishing Tackle.

Dame, Stoddard & Kendall, Boston, Mass.

Flint and Emery Paper.

Baeder, Adamson & Co., Phila., Pa.

Fodder Cutters.

Silver Mfg. Co., Salem, O.

Forges, Portable, &c.

Buffalo Forge Co., Buffalo, N. Y.
Champion Blower & Forge Co., Lancaster, Pa.
Foss Mfg. Co., Springfield, Ohio.
Sturtevant, B. F. Co., Boston, Mass.

Forgings, Iron and Steel.

Bethlehem Iron Co., S. Bethlehem, Pa.
Cambria Steel-Cambria Iron Co., Johnstown, Pa.
Frankford Steel Co., Phila., Pa.
Scranton Forging Co., Scranton, Pa.
U. S. Projectile Co., Brooklyn, N. Y.

Forks, Hay and Manure.

Iowa Farming Tool Co., Ft. Madison, Iowa.
Withington & Cooley Mfg. Co., Jackson, Mich.

Foundry Facings.

Dixon, Jos., Crucible Co., Jersey City, N. J.
S. Obermayer Co., Cincinnati, O.
Smith's Pattern Works, Akron, Ohio.

Foundry Riddles.

Estey, W. S., 65 Fulton, N. Y.

Foundry Supplies.

S. Obermayer Co., Cincinnati, O.
Rice Mfg. Co., New Durham, N. H.
Smith, J. D., Fdy. Supply Co., Cinn., O.

Friction Clutches.

Brown, A. & F., 17 Day St., N. Y.
Keystone Clutch & Mch. Wks., Phila., Pa.
Moore & White Co., Philadelphia, Pa.

Furnaces, Foundry.

Byram & Co., Detroit, Mich.

Galvanized Material.

Jersey City Galvanizing Co., 112 John St., N. Y.

Galvanizing and Tinning.

Wilcox, Crittenden & Co., Middletown, Conn.

Gas Producers.

Wood, R. D. & Co., Philadelphia, Pa.

Gas Stoves.

Bolgiano Mfg. Co., Baltimore, Md.

Gas & Steam Fitters' Supplies.

Leavitt Mch. Co., Orange, Mass.
Pancoast, Henry B. & Co., Phila., Pa.

Gate Hinges.

Wrightsville Hdw. Co., Wrightsville, Pa.

Gear Cutters.

D. E. Whiton Mach. Co., New London, Conn.

Gears.

Boston Gear Works, Boston, Mass.
Lincoln Iron Works, Rutland, Vt.
Pole, Robt. & Son, Co., Baltimore, Md.
U. S. Projectile Co., Brooklyn, N. Y.

Glass Boards.

Canton Saw Co., Canton, O.
Lufkin Rule Co., Saginaw, Mich.

Glass Cutters.

Monce, S. G., Bristol, Conn.

Glaziers' Points.

Shelton Co., Birmingham, Conn.

Glue.

Baeder, Adamson & Co., Phila., Pa.
Dodd, A. W. & Co., Gloucester, Mass.
Russia Cement Co., Gloucester, Mass.

Grate Guards.

Dow Wire Works Co., Louisville, Ky.

Grinding Mills.

Foss Mfg. Co., Springfield, O.

Grinding and Polishing Machines.

Cutter, Wood & Stevens, Boston, Mass.
Diamond Mach. Co., Providence, R. I.
Norton Emery Wheel Co., Worcester, Mass.

Grindstone Dressing Machinery.

Blake & Johnson, Waterbury, Conn.

Grindstones.

Cleveland Stove Co., Cleveland, O.

Gun Implements.

Bridgeport Gun Implement Co., 318-315 Broadway, N. Y.

Gunpowder, Makers of.

Luffin & Rand Powder Co., 29 Murray St., N. Y.

Gymnasium Supplies.

Independent Electric Co., Chicago, Ill.

Handles.

Cleveland Wood Turning Co., Cleveland, O.

Hangers, Door.

Chicago Spring Butt Co., Chicago, Ill.
Coburn Trolley Track Mfg. Co., Holyoke, Mass.
Lane Bros., Poughkeepsie, N. Y.

Hardware Comm'n Merchants.

Jacobus, W. H., 90 Chambers, N. Y.

Hardware Drawers.

Wernicke Co., Minneapolis, Minn.

Hardware Jobbers.

White, Van Glahn & Co., 15-17 Chatham Square, N. Y.

Hardware Manufacturers.

Allentown Hardware Works, Allentown, Pa.
Miller Falls Co., 93 Reade St., N. Y.
Stearns, E. C. & Co., Syracuse, N. Y.
Streeter, N. R. & Co., Groton, N. Y.
Supplee Hdw. Co., Phila., Pa.
Union Mfg. Co., 103 Chambers, N. Y.
Yale & Towne Mfg. Co., Stamford, Conn.

Hardware Mfrs. Agents.

Bingham, W. Co., Cleveland, O.
Graham, John H. & Co., 113 Chambers, Sicks, Sweet & Lyon, 35 Barclay, N. Y.

Hardware Specialties.

Acme Shear Co., Bridgeport, Conn.
Berger Bros., Philadelphia, Pa.
Eusey Mfg. Co., Philadelphia, Pa.
Ette & Henger Mfg. Co., St. Louis, Mo.
Johnson, S. C., Racine, Wis.
North Bros. Mfg. Co., Philadelphia, Pa.
Scranton & Co., New Haven, Conn.
Union Lock & Hdw. Co., Lancaster, Pa.
Wilson, J. Fred., Worcester, Mass.
Wrightsville Hdw. Co., Wrightsville, Pa.

Harness Snaps.

Covert Mfg. Co., West Troy, N. Y.
Coverts' Saddlery Wks., Farmer, N. Y.
Fitch, W. & E. T., New Haven, Conn.

Hay Tools.

Myers, F. E. & Bro., Ashland, O.

Hoes.

Withington & Cooley Mfg. Co., Jackson, Mich.

Hog Rings and Ringers.

Oakes & Irwin, Decatur, Ill.

Hoisting Machines.

Box, Alfred & Co., 314 Green, Phila., Pa.
Brown Hoisting & Conveying Mch. Co., Cleveland, Ohio.
Byers, Jno. F. Mch. Co., Ravenna, O.
Fulton Iron & Engine Wks., Detroit, Mich.
Harrington, E. Son & Co., Phila., Pa.
Jedgerwood Mfg. Co., 96 Liberty, N. Y.
Lincoln Iron Works, Rutland, Vt.
McCoy, Jos. F. & Co., 28 Warren St., New York.
Maris & Beekley, Philadelphia.
Moore Mfg. & Fdy. Co., Milwaukee, Wis.
Morris, Williams & Co., Phila.
Sellers, Wm. & Co., Phila. and N. Y.
Spedel, J. G., Reading, Pa.
Yale & Towne Mfg. Co., Stamford, Ct.

Hollow Ware.

Avery Stamping Co., Cleveland, O.
Bronson Supply Co., Cleveland, Ohio.
Cleveland Stamping & Tool Co., Cleveland, O.

Hollow Ware, Aluminum.

Stuart & Peterson Co., Phila., Pa.

Horse Clippers.

Gillette Clipping Machine Co., 201 E. 23d St., N. Y.

Horse Nails, Makers of.

Capewell Horse Nail Co., Hartford, Conn.
National Horse Nail Co., Vergennes, Vt.
Putnam Nail Co., Neponset, Boston, Mass.

Horse and Mule Shoes, Makers of.

Bryden Horse Shoe Co., Catsauqua, Pa.
Burden Iron Co., Troy, N. Y.
Crescent Horse Shoe & Iron Co., Max Meadows, Va.
Leonard, J., 446 West St., N. Y.
Old Dominion Iron & Nail Works Co., Richmond, Va.
Phoenix Horse Shoe Co., Poughkeepsie, N. Y.
Rhode Island Perkins Horse Shoe Co., Providence.
Shoenberger & Co., Pittsburgh, Pa.
Stard Horse Shoe Co., Boston, Mass.

Hose.

Cleveland Rubber Works, Cleveland, O.
N. Y. Belling & Packing Co., Ltd., 16 Park Row, N. Y.

Hydrants, &c.

McLean, John, 296 & 298 Monroe, N. Y.

Hydraulic Forging.

U. S. Projectile Co., Brooklyn, N. Y.

Hydraulic Jacks.

Dudgeon, Richard, 24 Columbia, N. Y.
McCoy, Jos. F. Co., 20 Warren St., N. Y.

Hydraulic Machinery.

Wood, Wm. H., Media, Pa.

Ice Cream Freezers.

White Mountain Freezer Co., Nashua, N. H.

Injectors.

Eynon-Evans Mfg. Co., Philadelphia, Pa.
Jenkins Bros., New York.

Insurance, Boiler.

Hartford Steam Boiler Inspection & Insurance Co., Hartford, Conn.

Iron and Steel, Swedish.

Lundberg, Gustaf, Boston, Mass.
Milne, A. & Co., 1 Broadway, N. Y.

Iron Commission Brokers.

Butze, Adolph, St. Louis, Mo.
Corning, Edw. & Co., 20 B'way, N. Y.
Cotton, Barclay W. & Co., Phila.
Etting, Edw. J., Philadelphia.
Hogan, John L. & Co., Philadelphia, Pa.
Hoffman, J. W. & Co., Philadelphia.
Levis, Henry & Co., Philadelphia.
Levy, Jerome & Co., Philadelphia.
Lea, J. Tatnall & Co., Philadelphia.
Mohr, J. J., 430 Walnut, Philadelphia.
Pilling & Crane, Philadelphia, Pa.
Wister, L. & R. & Co., Phila., Pa.

Iron Ore.

Samuel, Frank, Philadelphia, Pa.

Iron, Merchants.

Barns, C. K. & Co., Philadelphia, Pa.
Borden & Lovell, 70 West, N. Y.
Corning, Edw. & Co., 20 B'way, N. Y.
Cotton, Justice, Jr., Philadelphia.
Cotton, Barclay W. & Co., Phila.
Cunliffe, R. M., Phila., Pa.
Hoffman, J. W. & Co., Philadelphia.
Leonard, J., 446 West St., N. Y.
Nicolls, Wheeler & Co., Philadelphia.
Ogden & Wallace, 577 to 583 Greenwich St., N. Y.

Pierson & Co., 29 Broadway, N. Y.
Thomson, W. H. & Co., Phila., Pa.
Wallace, Wm. H. & Co., 68 B'way, N. Y.
Whitney, A. R. & Co., 17 B'way, N. Y.
Wilson, E. H. & Co., Philadelphia.

Iron, Importers.

Abbott, Wheelock & Co., N. Y. and Boston.
Lundberg, Gustaf, Boston, Mass.

Iron, Sheet, Manufacturers of.

Cambridge Iron & Steel Co., Cambridge, Ohio.
W. Dewees Wood Co., Lim., McKeesport, Pa.

Ironwork, Ornamental.

Barnum, E. T., Detroit, Mich.
Champion Iron Co., Kenton, O.
Ludlow-Saylor Wire Co., St. Louis, Mo.
The Van Dorn Iron Works Co., Cleveland, O.

Japanning.

Smith, Theo. V., 54 John St., N. Y.

Keys.

Wollensak, J. F., Chicago, Ill.

Ladles.

Whiting Fdy. Equipment Co., Chicago, Ill.

Lanterns.

Buhl Stamping Co., Detroit, Mich.
Steam Gauge & Lantern Co., Syracuse, N. Y.

Lasts.

Kupferle, Jno. C., St. Louis, Mo.

Lathes.

Beaman & Smith, Providence, R. I.
Dietz, Schumacher & Co., Cincinnati, O.
Draper Machine Tool Co., Worcester, Mass.
Harrington, E. Son & Co., Phila., Pa.
Johnson, Israel H. Jr., & Co., Philadelphia, Pa.
New Haven Mfg. Co., New Haven, Conn.
Sebastian Lathe Co., Cincinnati, O.
Seneca Falls Mfg. Co., Seneca Falls, N. Y.

Lathing, Expanded Metal.

Chess Bros., Pittsburgh, Pa.

Lathing, Wire.

Clinton Wire Cloth Co., Clinton, Mass.
N. J. Wire Cloth Co., Trenton, N. J.
Wright & Colton Wire Cloth Co., Worcester, Mass.

Lawn Mowers.

Blair Mfg. Co., Springfield, Mass.
Chadborn & Coldwell Mfg. Co., Newburgh, N. Y.
Coldwell Lawn Mower Co., Newburgh, N. Y.
Dille & McGuire Mfg. Co., Richmond, Ind.
F. & N. Mfg. Co., Richmond, Ind.
Henley, M. C., Richmond, Ind.

Lawn Rakes.

Gibbs Mfg. Co., Canton, Ohio.
Kohler, F. E. & Co., Canton, O.

Lawn Sprinklers.

Blair Mfg. Co., Springfield, Mass.
Ette & Henger Mfg. Co., St. Louis, Mo.
McGowan, John H. Co., Cincinnati, O.

Letters and Figures, Metallic.

White, A. A. & Co., Providence, R. I.

Letters, Paper.

Tablet & Ticket Co., Chicago, Ill.

Levels.

Richardson, C. F. & Son, Athol, Mass.

Locks and Knobs, Manufacturers of.

Deltz, A. E., 97 Chambers, N. Y.
Reading Hdw. Co., Reading, Pa.
Smith & Egge Mfg. Co., Bridgeport, Conn.
Warner Lock Co., Chicago, Ill.
Yale & Towne Mfg. Co., Stamford, Conn.

Lubricants.

Dixon, Jos., Crucible Co., Jersey City, N. J.

Machinery.

Am. Tool Works, Cleveland, Ohio.
Ayer, H. C. & Gleason Co., Phila., Pa.
Barnes, W. F. & John, Rockford, Ill.
Beaman & Smith, Providence, R. I.
Bement, Miles & Co., Philadelphia, Pa.
Bigelow, C. E., 45 Dey, N. Y.
Bisnall & Keeler Mfg. Co., St. Louis.
Bliss, E. W. Co., Brooklyn, N. Y.
Briggs, Marvin, 12 Broadway, N. Y.
Bullard Mch. Tool Co., Bridgeport, Conn.
Carlin's Sons, Thos., Allegheny, Pa.
Clapp, Geo. M., agt., 74 Cortlandt, N. Y.
Detrick & Harvey Mch. Co., Baltimore, Md.
Dietz, Schumacher & Co., Cincinnati, Ohio.
Fitchburg Mch. Works, Fitchburg, Mass.
Garvin Mch. Co., Lighthouse, Canal Sts.
Gould & Eberhardt, Newark, N. J.
Hamilton Mch. Tool Co., Hamilton, O.
Harrington, E. Son & Co., Phila., Pa.
Hartford Machine Screw Co.,

- Place, Geo.**, 145 Broadway, N. Y.
Pond, L. W. Mch. Co., Worcester, Mass.
Pond, Robt. & Son Co., Baltimore, Md.
Powell Planer Co., Worcester, Mass.
Prentiss Tool & Supply Co., N. Y.
Scranton Supply & Mchry. Co., Scranton, Pa.
Sellers, Wm. & Co., Phila.
Seyfert's Sons, L. F., Philadelphia, Pa.
Signourney Tool Co., Hartford, Conn.
Stephoe, J. & Co., Cincinnati, O.
Stow Flexible Shaft Co., Ltd., Phila.
Toomey, Frank, Philadelphia, Pa.
Walker Mfg. Co., Cleveland, O.
Wetherill, Robert & Co., Chester, Pa.
Wilson, W. A., Rochester, N. Y.
- Machinery for Hardware Manufacturers.**
Adt, Jno. & Son, New Haven, Conn.
- Machine Knives.**
Loring, Coes & Co., Worcester, Mass.
Loyd, John, 558-562 Water St., N. Y.
Simonds Mfg. Co., Fitchburg, Mass.
- Machine Screws.**
American Iron & Bolt Co., Cincinnati, Ohio.
Bubbell, Harvey, Bridgeport, Ct.
Phila. Mach. Screw Works, Phila., Pa.
Rhode Island Tool Co., Providence, R. I.
- Machine Tools.**—See Machinery.
- Machine Work.**
Papping, J., 58th St. & 11th Ave., N. Y. City.
- Machinists' Scales.**
Coffin & Leighton, Syracuse, N. Y.
Starrett, L. S., Athol, Mass.
- Machinists' Tools and Supplies.**
King, J. M. & Co., Watertown, N. Y.
Sellers, Wm. & Co., Inc., Phila.
- Manufacturing Sites.**
Chicago, Milwaukee & St. Paul R. R., Chicago, Ill.
- Measuring Tapes.**
Lufkin Rule Co., Saginaw, Mich.
- Meat Choppers.**
Enterprise Mfg. Co., Philadelphia, Pa.
- Meat Cutters.**
North Bros. Mfg. Co., Philadelphia, Pa.
- Mechanical Instruction.**
Correspondence School of Mechanics, Scranton, Pa.
- Metals.**
Fearing, Wm. S., 100 Chambers, N. Y.
Hendricks Bros., 49 Cliff, N. Y.
- Metal Brokers.**
American Metal Co., N. Y.
- Metal Saws.**
Q. & C. Co., Chicago, Ill.
- Metallurgists.**
Britton, J. Blodgett, Phila., Pa.
- Mining Knives.**
Palmer Hdw. Mfg. Co., Troy, N. Y.
Streeter, N. R. & Co., Groton, N. Y.
- Mine Lamps.**
Darby, Edw. & Sons, Phila., Pa.
Leonard, B. E., Scranton, Pa.
- Mining Screens.**
Harrington & King Perforating Co., Chicago, Ill.
Howard & Morse, 45 Fulton, N. Y.
- Mining Machinery.**
Allis, E. P. Co., Milwaukee, Wis.
- Models, Makers of.**
Ideal Machine Works, Hartford, Conn.
- Molding Sand.**
Obermayer, S. Co., Cincinnati, O.
- Motors, Water and Electric.**
Bolzano Mfg. Co., Baltimore, Md.
Q. & C. Electric Co., 402 and 404 Greenwich St., N. Y.
Dallett, Thomas H. & Co., Phila., Pa.
- Nail Machinery.**
Pittsburgh Mfg. Co., Pittsburgh, Pa.
- Nail and Tack Pullers.**
Am. Specialty Co., Hartford, Conn.
Scranton & Co., New Haven, Conn.
- Nails (Cut) and Spikes.**
Borden & Lovell, 70 West, N. Y.
Pottstown Iron Co., Pottstown, Pa.
Riverside Iron Wks., Wheeling, W. Va.
Valley Steel Co., St. Louis, Mo.
- Nickel Plated Supplies.**
Eddy Electric Mfg. Co., Windsor, Conn.
- Norway Shapes, Rollers of.**
Rowland, William & Harvey, Frankford, Philadelphia.
- Novelty Manufacturers.**
Ideal Machine Works, Hartford, Conn.
- Nut Machines.**
Dunham Nut Co., Unionville, Ct.
- Nuts, Bolts, &c., Makers of.**
American Bolt Co., Lowell, Mass.
American Iron & Bolt Co., Cincinnati, Ohio.
American Screw Co., Providence, R. I.
Blake & Johnson, Waterbury, Conn.
Dunham Nut Co., Unionville, Conn.
Haskell, Wm. H. Co., Pawtucket, R. I.
Mt. Carmel Bolt Co., Mt. Carmel, Conn.
Pennsylvania Bolt & Nut Co., Lebanon, Pa.
Port Chester Bolt & Nut Co., Port Chester, N. Y.
Rhode Island Tool Co., Providence, R. I.
Russell, Burdall & Ward, Port Chester, N. Y.
Sternbergh, J. H. & Son, Reading, Pa.
Wilson, J. Fred., Worcester, Mass.
Wm. H. Haskell Co., Pawtucket, R. I.
- Oilers.**
Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.
- Oil Heaters.**
Parker, Chas. Co., Meriden, Conn.
- Oilless Anti-Friction Metals.**
North American Metalline Co., Long Island City, N. Y.
- Oil Stones.**
Pike Mfg. Co., Pike Station, N. H.
- Ores.**
Wister, Francis, Philadelphia, Pa.
- Ox Shoes.**
Scranton Forging Co., Scranton, Pa.
- Packing.**
Morrison, Robert, St. Louis, Mo.
N. Y. Belting & Packing Co., Ltd., N. Y.
- Padlocks.**
Ames Sword Co., Chicopee, Mass.
Fraim, E. T., Lancaster, Pa.
Union Lock & Hdw. Co., Lancaster, Pa.
Wolf, W. & L., Phila., Pa.
- Pails.**
Richmond Cedar Wks., Richmond, Va.
- Paint.**
Garry Iron & Steel Roofing Co., Cleveland, O.
- Paint Burners.**
Dangler Stove & Mfg. Co., Cleveland, Ohio.
- Paint Cans.**
Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.
- Pants Stretcher.**
Covert Mfg. Co., West Troy, N. Y.
- Patent Solicitors.**
Butler, C. N., Phila., Pa.
Jenner, H. W. T., Washington, D. C.
Eaton & Howson, Philadelphia and Washington.
Stocking, E. B., Washington, D. C.
- Pattern Letters.**
Wells, Heber, 167 William St., N. Y.
- Perforated Metal.**
Clinton Wire Cloth Co., Clinton, Mass.
Harrington & King Perforating Co., Chicago, Ill.
Hendrick Mfg. Co., Ltd., Carbondale, Pa.
- Phosphor Bronze.**
Phosphor Bronze Smelting Co., Limited, Philadelphia.
- Phosphor Tin.**
Crescent Phosphorized Metal Co., Philadelphia, Pa.
Halk & Naumann, 516 Pearl, N. Y.
- Picks and Mattocks.**
Plumb, Fayette R., Philadelphia, Pa.
- Pig Iron.**
Houston, C. B. & Co., Philadelphia, Pa.
Montour Iron & Steel Co., Danville, Pa.
Naylor & Co., 45 Wall, N. Y.
Pilling & Crane, Philadelphia, Pa.
Samuel, Frank, Philadelphia, Pa.
- Pig Iron Storage.**
Am. Pig Iron Storage Warrant Co., 44 Wall, N. Y.
- Pile Drivers.**
Vulcan Iron Works, Chicago, Ill.
- Pipe, Bent.**
National Pipe Bending Co., New Haven, Conn.
- Pipe Cutting and Threading Machines.**
Armstrong Mfg. Co., Bridgeport, Conn.
Bignall & Keeler Mfg. Co., St. Louis, Mo.
Dick & Harvey Mch. Co., Baltimore, Md.
Merrill Mfg. Co., Toledo, O.
Pancoast, Henry B. & Co., Phila.
Saunders' Sons, D., Yonkers, N. Y.
Walworth Mfg. Co., Boston, Mass.
- Pipe Grips.**
Prentiss Vise Co., 44 Barclay, N. Y.
- Pipes, Fittings, &c., Makers of.**
McNab & Harlin Mfg. Co., N. Y.
- Pipe, Sewer.**
Columbus Sewer Pipe Co., Columbus, Ohio
- Pipe, Water and Gas. Makers of.**
Donaldson Iron Co., Emaus, Pa.
Riverside Iron Works, Wheeling, W. Va.
Wood, R. D. & Co., Philadelphia, Pa.
- Plane Irons. Manufacturers of.**
Buck Bros., Millbury, Mass.
Buck, Chas., Millbury, Mass.
- Planers.**
Dick & Harvey Mch. Co., Baltimore, Md.
New Haven Mfg. Co., New Haven, Conn.
Pond, L. W. Mch. Co., Worcester, Mass.
Powell Planer Co., Worcester, Mass.
Wilson, W. A., Worcester, Mass.
- Planes, Manufacturers of.**
Stanley Rule & Level Co., N. Y.
- Plated Ware.**
Boardman, L. & Son, New Haddam, Ct.
Bohmes & Edwards Silver Co., Bridgeport, Conn.
Rogers, Wm. Mfg. Co., Hartford, Ct.
- Plate, Iron and Steel, Mfrs. of.**
Edin Standard Iron & Steel Co., Bridgeport, O.
Lukens Iron & Steel Co., Coatesville, Pa.
Mahoning Valley Iron Co., Youngstown, Ohio.
Moorehead-McLean Co., Pittsburgh, Pa.
McIlwain & Sons, Reading, Pa.
Pottstown Iron Co., Pottstown, Pa.
Pottsville Iron & Steel Co., Pottsville, Pa.
Singer, Nimick & Co., Pittsburgh, Pa.
The Mahoning Valley Iron Co., Youngstown, O.
Wood, Alan Co., Philadelphia.
- Plating, Nickel, Brass and Silver.**
Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.
- Polishing Machines.**
Watson & Stillman, 204 E. 43d, N. Y.
- Post Hole Diggers.**
Gibbs Mfg. Co., Canton, Ohio.
Kohler, F. E. & Co., Canton, O.
- Poultry Nettings.**
Barnum, E. T., Detroit, Mich.
Gilbert & Bennett Mfg. Co., 42 Cliff St., N. Y.
N. Y. Wire Cloth Co., Trenton, N. J.
"Silver Finish."
Tyler Wire Works Co., W. S., Cleveland, O.
Wright & Colton Wire Cloth Co., Worcester, Mass.
- Powder.**
Lafin & Rand Powder Co., 29 Murray, New York Powder Co., 62 Liberty St., N. Y.
- Power Hammers.**
Dienelt & Eisenhardt, Philadelphia.
Dupont Mfg. Co., St. Johnsbury, Vt.
Jenkins & Lingle, Bellefonte, Pa.
Miner & Peck Mfg. Co., New Haven, Conn.
Scranton & Co., New Haven, Conn.
- Power Transmitting Machinery.**
Dodge Mfg. Co., Mishawaka, Ind.
- Presses, Dies, &c.**
E. W. Bliss Co., Brooklyn, N. Y.
Crosby, G. A. & Co., Chicago, Ill.
Stiles & Parker Press Co., Brooklyn, N. Y.
Waterbury Mch. Co., Waterbury, Ct.
- Presses, Power, Makers of.**
Bliss, E. W. Co., Brooklyn, N. Y.
Manville, E. J. Mch. Co., Waterbury, Ct.
Waterbury Farrel Foundry & Machine Co., Waterbury, Conn.
- Printing and Embossing.**
Griffith, Axtell & Cady Co., Holyoke, Mass.
- Pulleys.**
Brown, A. & F., 17 Dey St., N. Y.
Dodge Mfg. Co., Mishawaka, Ind.
Keystone Clutch Mch. Wks., Phila., Pa.
Reading Wood Pulley Co., Reading, Pa.
- Pumping Machinery.**
Dean Bros. Steam Pump Works, Indianapolis, Ind.
Goulds Mfg. Co., Seneca Falls, N. Y.
Hooker-Colville Steam Pump Co., St. Louis, Mo.
McGowan, J. H. & Co., Cincinnati, O.
Martin, J. & Son, Jersey City, N. J.
Norwalk Iron Works Co., So. Norwalk, Conn.
Southwark Fdy. & Mch. Co., Phila., Pa.
Valley Pump Works, Easthampton, Mass.
Worthington, Henry R., 86 and 88 Liberty St., N. Y.
- Pump Leathers.**
Detroit Valve & Washer Co., Detroit, Mich.
- Pumps, Makers of.**
Deming Co., Salem, O.
Douglas, W. & B., Middletown, Conn.
Goulds Mfg. Co., Seneca Falls, N. Y.
Myers, F. E. & Bro., Ashland, O.
- Punches.**
Richards, I. P., Providence, R. I.
- Punches and Shears, Hand and Power.**
E. W. Bliss Co., Brooklyn, N. Y.
Butts & Ordway, Boston, Mass.
Crosby, G. A. & Co., Chicago, Ill.
Stiles & Parker Press Co., Brooklyn, N. Y.
Waterbury Farrel Foundry & Machine Co., Waterbury, Conn.
Watson & Stillman, 204 E. 43d, N. Y.
- Rails, Old and New.**
Perry, W. H. & Co., Providence, R. I.
- Rat and Mouse Traps.**
Burditt & Williams, Boston, Mass.
Estey, W. S., 65 Fulton, N. Y.
Excelsior Cutlery Co., Worcester, Mass.
- Razors, Manufacturers of.**
Millbury Razor Co., Millbury, Mass.
- Reducing Valves.**
D'Este & Seeley Co., Boston, Mass.
- Reels.**
Hendryx, A. B. Co., New Haven, Conn.
- Refrigerators.**
Wisconsin Refrigerator Co., Eau Claire, Wis.
- Rivers.**
Blake & Johnson, Waterbury, Conn.
Buck Iron Co., Troy, N. Y.
Clark & Cowles, Plainville, Conn.
Cobb & Drew, Plymouth, Mass.
Sternbergh, J. H. & Son, Reading, Pa.
Townsend, W. P. & Co., New Brighton, Pa.
- Riveting Machines.**
Adt, Jno. & Sons, New Haven, Conn.
- Rolling Mill Machinery.**
Birmingham Iron F'dry, Birmingham, Ala.
Booth, The Lloyd Co., Youngstown, O.
Leechburg Foundry & Mch. Co., Pittsburgh, Pa.
Morgan Construction Co., Worcester, Mass.
Robinson-Rea Mfg. Co., Pittsburgh.
Totten & Hogg Iron and Steel F'dry Co., Pittsburgh, Pa.
Trethewey Mfg. Co., Pittsburgh, Pa.
Waterbury Farrel Foundry & Mch. Co., Waterbury, Conn.
- Rolls, Chilled, Sand and Steel.**
Birmingham Iron Foundry, Birmingham, Conn.
Booth, The Lloyd Co., Youngstown, O.
East Chicago F'dry Co., Chicago, Ill.
Garrison, A. F'dry Co., Pittsburgh, Pa.
Robinson-Rea Mfg. Co., Pittsburgh, Pa.
Seaman, Sleeth & Black, Pittsburgh.
Totten & Hogg Iron and Steel F'dry Co., Pittsburgh, Pa.
- Roofing.**
Berlin Iron Bridge Co., E. Berlin, Conn.
Cincinnati Corrugating Co., Piqua, O.
N. Y. Iron Roofing & Corrugating Co., Jersey City, N. J.
- Rope and Web Goods.**
Covert Mfg. Co., West Troy, N. Y.
Covert's Saddlery Wks., Farmer, N. Y.
- Rope Wheels.**
Cresson, Geo. V. Co., Philadelphia, Pa.
- Rubber Goods.**
Canfield, H. O., Bridgeport, Conn.
- Rules, Manufacturers of.**
Stanley Rule & Level Co., 29 Chambers, Stephens & Co., Riverton, Conn.
- Sad Irons.**
Enterprise Mfg. Co., Phila., Pa.
Streeter, N. R. & Co., Groton, N. Y.
- Sad Irons, Gas.**
Bolzano Mfg. Co., Baltimore, Md.
- Sand Paper.**
Baeder, Adamson & Co., Phila., Pa.
- Sash Balances.**
Caldwell Mfg. Co., Rochester, N. Y.
Pullman Sash Balance Co., Rochester, N. Y.
- Sash Cords and Chains.**
Morton, Thos., 45 Elizabeth, N. Y.
Samson Cordage Works, Boston, Mass.
Smith & Egge Mfg. Co., Bridgeport.
- Sash Pulleys.**
Palmer Hardware Mfg. Co., Troy, N. Y.
- Sash Weights.**
Brown, E. E. & Co., Philadelphia, Pa.
Kings County Iron Foundry, Brooklyn, N. Y.
Norton Bros., Chicago, Ill.
- Saw Filing Machines.**
Disston, Henry & Sons, Philadelphia, Pa.
- Saws, Makers of.**
Atkins, E. C. & Co., Indianapolis, Ind.
Disston, Henry & Sons, Phila., Pa.
National Saw Co., Newark, N. J.
Simonds Mfg. Co., Fitchburg, Mass.
- Saw Sets.**
Taintor Mfg. Co., 84-86 Chambers, N. Y.
- Saw Vises.**
Seneca Falls Mfg. Co., Seneca Falls, N. Y.
- Sawing Machines.**
Q. & C. Co., Chicago, Ill.
- Scales, Manufacturers of.**
Buffalo Scale Co., Buffalo, N. Y.
Chatillon, John & Sons, 85-89 Cliff, N. Y.
Standard Scale & Fixtures Co., St. Louis, Mo.
- Scrapers, Road.**
Sidney Steel Scraper Co., Sidney, O.
- Screens, Coal and Ore.**
Hendrick Mfg. Co., Ltd., Carbondale, Pa.
- Screw Cutting Machinery.**
Wells Bros. & Co., Greenfield, Mass.
Wiley & Russell Mfg. Co., Greenfield, Mass.
- Screw Drivers.**
Brown, R. H. & Co., New Haven, Conn.
Mayhew, H. H. Co., Shelburne Falls, Mass.
- Screw Machinery.**
Hartford Machine Screw Co., Hartford, Conn.
- Screw Plate and Pipe Cutter.**
Jarecki Mfg. Co., Erie, Pa.
- Screws, Makers of.**
American Screw Co., Providence, R. I.
Blake & Johnson, Waterbury, Conn.
Wm. H. Haskell Co., Pawtucket, Miles, F. S., 205 Quarry, Philadelphia.
Reynolds & Co., New Haven, Conn.
Worcester Machine Screw Co., Worcester, Mass.
- Scroll Saws.**
Barnes, W. F. & John, Rockford, Ill.
Millers Falls Co., 93 Reade St., N. Y.
Seneca Falls Mfg. Co., Seneca Falls, N. Y.
- Seythe Stones and Whetstones.**
Pike Mfg. Co., Pike Station, N. H.
Cleveland Stone Co., Cleveland, O.
- Shafting, Makers of.**
Brown, A. & F., 17 Dey St., N. Y.
Cresson, Geo. V. Co., Philadelphia, Pa.
Fairmount Mch. Co., Philadelphia, Pa.
Sellers, Wm. & Co., Inc., Phila., Pa.
Stow Mfg. Co., Binghamton, N. Y.
- Shaped Iron and Steel, Manufacturers of.**
Aetna Standard Iron & Steel Co., Bridgeport, O.
East Chicago F'dry Co., Chicago, Ill.

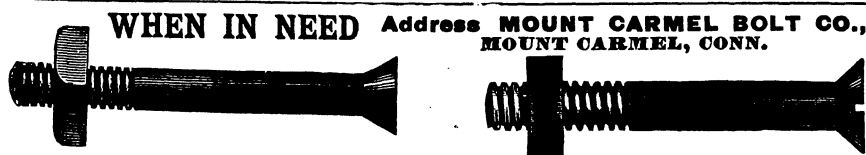
- Allentown Rolling Mill**, Allentown, Pa.
Lockhart Iron & Steel Co., Pittsburgh, Pa.
Passaic Rolling Mill Co., Paterson, N.J.
The Phoenix Iron Co., Phila., Pa.
Pottsville Iron & Steel Co., Pottsville, Pa.
Roberts, A. & P. & Co., Phila., Pa.
- Shears and Scissors.**
Acme Shear Co., Bridgeport, Conn.
Clauss Shear Co., Fremont, Ohio.
Helmichs, R. Sons Co., Newark, N. J.
- Sheet Iron and Steel, Manufacturers of.**
Atlas-Standard Iron and Steel Co., Bridgeport, O.
Cambridge Iron & Steel Co., Cambridge, Ohio.
Jersey City Galvanizing Co., 112 John St., N. Y.
Mahoning Valley Iron Co., Livingston, Ohio.
Morehead-McCleave Co., Pittsburgh, Pa.
Pierion & Co., 29 Broadway, N. Y.
Singer, Nimick & Co., Ltd., Pittsburgh, Pa.
The Mahoning Valley Iron Co., Youngstown, O.
Alan Wood Co., Philadelphia.
W. Dewees Wood Co., McKeesport, Pa.
- Sheet Zinc.**
Mathiessen & Hegeler Zinc Co., La Salle, Ill.
- Shelf Brackets.**
Atlas Mfg. Co., New Haven, Conn.
Stanley Works, New Britain, Conn.
- Shoe Stands.**
Kupferle, Jno. C., St. Louis, Mo.
- Shovels.**
Peninsular Metal Works, Detroit, Mich.
- Show Cases.**
Union Show Case Co., Chicago, Ill.
- Sinks.**
Douglas, W. & B., Middletown, Conn.
- Skate Grinding Machinery.**
Perkins, Chas., Bridgewater, Mass.
- Skates, Ice.**
Keene Mfg. Co., Keene, N. H.
Supplies Hardware Co., Phila., Pa.
Winslow, Sam'l., Skate Mfg. Co., Worcester, Mass.
- Skates, Roller.**
Henley, M. C., Richmond, Ind.
Winslow, Sam'l., Skate Mfg. Co., Worcester, Mass.
- Slaw Cutters.**
Tucker & Dorsey Mfg. Co., Indianapolis, Ind.
- Smelting Works.**
Reeves, Paul S., 760 S. Broad, Phila.
- Soldering Coppers.**
Clendenin Bros., Baltimore, Md.
Covert Mfg. Co., West Troy, N. Y.
- Soup Digesters.**
Stuart & Peterson Co., Phila., Pa.
- Speaking Tubes.**
Ostrander, W. R. & Co., 204 Fulton St. N. Y.
Wollensak, J. F., Chicago, Ill.
- Special Machinery.**
Rhodes, L. E. Co., Hartford, Conn.
- Spelter.**
Mathiessen & Hegeler Zinc Co., La Salle, Ill.
- Spoons and Forks.**
Boardman, L. & Son, New Haddam, Conn.
Holmes & Edwards Silver Co., Bridgeport, Conn.
Rogers, The Wm. Mfg. Co., Hartford, Conn.
- Sporting Goods.**
Hartley & Graham, 313-315 B'way, N. Y.
- Spring Hinges.**
Bommer Bros., Brooklyn, N. Y.
Chicago Spring Butt Co., Chicago, Ill.
Pullman Sash Balance Co., Rochester, N. Y.
Stover Mfg. Co., Freeport, Ill.
Van Wagoner & Williams Hdw. Co., 14 Warren St., N. Y.
- Stamping Works.**
Avery Stamping Co., Cleveland, O.
Cleveland Stamping & Tool Co., Cleveland, O.
- Staples.**
Cobb & Drew, Plymouth, Mass.
Titchener, E. H. & Co., Binghamton, N. Y.
- Steam Ganges.**
Bristol Co., Waterbury, Conn.
Star Brass Mfg. Co., Boston, Mass.
- Steam Hammers, &c., Makers of.**
Dienelt & Eisenharit, Philadelphia.
Dudgeon, Richard, 24 Columbia Street, N. Y.
Trethewey Mfg. Co., Pittsburgh, Pa.
Wood, Wm. H., Media, Pa.
- Steam Heating & Oil Separators.**
Webster, Warren & Co., Camden, N. J.
- Steam Separators.**
Harrison Safety Boiler Wks., Phila., Pa.
Webster, Warren & Co., Camden, N. J.
- Steam Specialties.**
D'Este & Seeley Co., Boston, Mass.
Lunkenheimer Co., Cincinnati, O.
- Steam Traps.**
D'Este & Seeley Co., Boston, Mass.
- Steel, Cold Rolled Strip.**
Superior Steel Co., Pittsburgh, Pa.
Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.
- Steel Figures and Alphabet.**
Hoefig, C. W., 52 Fulton St., N. Y.
Krogerud, W., 61 Fulton St., N. Y.
- Steel Importers.**
Abbott, Wheelock & Co., N. Y. and Boston.
Hobson, Francis, Seaman & Co., 97 John St., N. Y.
Jessop, Wm. & Sons, Sheffield, England, or 91 John, N. Y.
Millie, A. & Co., 1 Broadway, N. Y.
Newton & Shipman, 83 John, N. Y.
Wetherell Bros., 93 Liberty St., N. Y.
Whitney, A. R. & Co., B'dway, N. Y.
Wolff, R. H. & Co., Ltd., 118th Street and Harlem River, N. Y.
- Steel (Mushet's Special).**
Jones, B. M. & Co., Boston.
- Steel Manufacturers.**
Atlas-Standard Iron & Steel Co., Bridgeport, O.
Bethlehem Iron Co., S. Bethlehem, Pa.
Baker, Hermann & Co., 103 Duane St.
Carbon Steel Co., Pittsburgh, Pa.
Chester Steel Castings Co., Phila., Pa.
Chrome Steel Works, Brooklyn, N. Y.
Crescent Steel Co., Philadelphia.
Frankford Steel Co., Philadelphia.
Gautier Steel Department of Cambria Iron Co., Johnstown, Pa.
Hobson, Francis, Seaman & Co., 97 John St., N. Y.
Jessop, Wm. & Sons, Sheffield, England, or 91 John, N. Y.
Kayser, Ellison & Co., Sheffield, Eng.
La Belle Steel Co., Pittsburgh, Pa.
Landon Iron Co., Salisbury, Conn.
Lukens Iron & Steel Co., Coatesville, Pa.
Moorhead-McCleave Co., Pittsburgh, Pa.
Moss, F. W., 83 John, N. Y.
Pottsville Iron and Steel Co., Pottsville, Pa.
Bowland, Wm. & Harvey, Frankford, Pa.
Singer, Nimick & Co., Pittsburgh.
Superior Steel Co., Pittsburgh, Pa.
Valley Steel Co., St. Louis, Mo.
Wordlaw & Co., Sheffield, Eng.
Wetherell Bros., 93 Liberty, N. Y.
Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.
- Steel, Manufacturers' Agents.**
Barns, C. K. & Co., Philadelphia, Pa.
Butze, Adolph, St. Louis, Mo.
Corning, Edw. & Co., 29 B'way, N. Y.
Lindsay, Jas. G. & Co., Phila., Pa.
Pierion & Co., 29 Broadway, N. Y.
- Steel Rails, Manufacturers of.**
Bethlehem Iron Co., S. Bethlehem, Pa.
Cambria Iron Co., Johnstown, Pa.
Montour Iron & Steel Co., Danville, Pa.
Riverside Iron Wks., Wheeling, W. Va.
- Steel, Tool.**
Frankford Steel Co., Philadelphia, Pa.
Jessop, Wm. & Sons, Sheffield, England, 91 John, N. Y.
Jones, B. M. & Co., Boston, Mass.
La Belle Steel Co., Pittsburgh, Pa.
- Step Ladders, Rolling.**
Bicycle Step Ladder Co., Chicago, Ill.
Coburn Trolley Track Mfg. Co., Holyoke, Mass.
Croissant, M., Albany, N. Y.
- Stocks and Dies.**
Armstrong Mfg. Co., Bridgeport, Conn.
Billings & Spencer Co., Hartford, Conn.
Butterfield & Co., Derby Line, Vt.
Hart Mfg. Co., Cleveland, O.
Oster Mfg. Co., Cleveland, O.
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Wells Bros. & Co., Greenfield, Mass.
Wiley & Russell Mfg. Co., Greenfield, Mass.
- Stone Saws and Planers.**
Lincoln Iron Works, Rutland, Vt.
- Store Fixtures.**
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- Stove Linings.**
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- Stove Pipe Thimbles.**
Cheney, S. & Son, Manlius, N. Y.
- Stove Trucks.**
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- Structural Tubing.**
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Mathiessen & Hegeler Zinc Co., La Salle, Ill.
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Chess Bros., Pittsburgh, Pa.
Clendenin Bros., Baltimore, Md.
Cobb & Drew, Plymouth, Mass.
Grand Crossing Tack Co., Grand Crossing, Ill.
Shelton Co., Birmingham, Conn.
- Tack and Nail Machinery.**
Kimball Bros. & Co., Brockton, Mass.
Sweetser, W. A., Brockton, Mass.
- Taps and Dies.**
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Carpenter, J. M., Tap & Die Co., Pawtucket, R. I.
Manning, Maxwell & Moore, 111 Liberty St., N. Y.
Wells Bros. & Co., Greenfield, Mass.
Wiley & Russell Mfg. Co., Greenfield, Mass.
- Testing Laboratories.**
Riehle Bros. Testing Mach. Co., Philadelphia.
- Testing Machines.**
Riehle Bros. Testing Mach. Co., Phila.
- Theoretical Hardware.**
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- Thill Springs.**
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- Thrust Collars.**
Gouverneur Mach. Co., Gouverneur, N. Y.
- Time Record.**
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- Tin Plate Machinery.**
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- Toe Calks, Steel.**
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- Tool Chests.**
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- Tool Holders.**
Armstrong Bros. Tool Co., Chicago, Ill.
- Tools.**
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Leavitt Mch. Co., Orange, Mass.
Mayhew, H. H. Co., Shelburne Falls, Mass.
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Richardson, C. F. & Son, Athol, Mass.
Standard Tool Co., Athol, Mass.
Stanley Rule & Level Co., 29 Chambers, Starrett, L. S., Athol, Mass.
Stearns, E. C. & Co., Syracuse, N. Y.
Stevens, J. Arms & Tool Co., Chicopee Falls, Mass.
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Butts & Ordway, Boston, Mass.
Champion Blower & Forge Co., Lancaster, Pa.
Oster Mfg. Co., Cleveland, Ohio.
Plumb, Fayette R., Philadelphia, Pa.
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Saunders Sons, D., Yonkers, N. Y.
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Schneider & Trenkamp Co., Cleveland, Ohio.
Standard Lighting Co., Cleveland, O.
- Tote Boxes.**
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- Transom Lifters.**
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- Tree Holders.**
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Lohan & Strowbridge Iron Co., New Brighton, Pa.
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Ansonia Brass & Copper Co., 19 and 21 Cliff, N. Y.
Randolph & Clowes, Waterbury, Conn.
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- Tumbling Barrels.**
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Merrill Bros., Brooklyn, E. D.
- Twist Drills, Makers of.**
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Morse Twist Drill & Machine Co., New Bedford, Mass.
New Process Twist Drill Co., Taunton, Standard Tool Co., Cleveland.
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Eynon-Evans Mfg. Co., Philadelphia, Pa.
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Lunkenheimer Co., Cincinnati, O.
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- Ventilator Appliances.**
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- Vise Jaws.**
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- Vises.**
Hollands Mfg. Co., Erie, Pa.
Howard Iron Works, Buffalo, N. Y.
Leavitt Tool Co., 44 Barclay St., N. Y.
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- Washing Machines.**
Richmond Cedar Wks., Richmond, Va.
- Water Meters.**
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- Wheelbarrows.**
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Gautier Steel Department of Cambria Iron Co., Johnstown, Pa.
Miller & Van Winkle, Brooklyn, N. Y.
New Castle Wire Nail Co., New Castle, Pa.
New Haven Wire Mfg. Co., New Haven, Conn.
Salem Wire Nail Co., Salem, O.
Stewart Wire Co., Easton, Pa.
Trenton Iron Co., Trenton, N. J.
Washburn & Moen Mfg. Co., Worcester.
Wetherell Bros., 93 Liberty St., N. Y.
Wolff, R. H. & Co., Ltd., 118th St. and Harlem River, N. Y.
Wright & Colton Wire Cloth Co., Worcester, Mass.
- Wire Cloth.**
Barnum, E. T., Detroit, Mich.
California Wire Works, San Francisco, Cal.
Clinton Wire Cloth Co., Clinton, Mass.
Darby, Edward & Sons, Philadelphia.
Estey, W. S., 65 Fulton, N. Y.
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N. J. Wire Cloth Co., Trenton, N. J.
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Wickwire Bros., Cortland, N. Y.
Wright & Colton Wire Cloth Co., Worcester, Mass.
W. S. Tyler Wire Works Co., Cleve'd.
- Wire Cutters.**
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- Wire Dies.**
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Newton & Shipman, 83 John St., N. Y.
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Gilbert & Bennett Mfg. Co., 42 Cliff St., N. Y.
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New York Wire Cloth Co., 102 Chambers St., N. Y.
Scheeler & Sons, Buffalo, N. Y.
Wickwire Bros., Cortland, N. Y.
Williamson, C. T., Wire Novelty Co., Newark, N. J.
Wire Goods Co., Worcester, Mass.
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- Wire Machinery.**
Am. Tool Wks., Cleveland, O.
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Morgan Construction Co., Worcester, Mass.
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- Wire Nails.**
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Indiana Wire Fence Co., Crawfordsville, Ind.
Kilmer Mfg. Co., Newburg, N. Y.
New Castle Wire Nail Co., New Castle, Pa.
Salem Wire Nail Co., Salem, O.
Taunton Wire Nail Co., Taunton, Mass.
Whitney, A. R. & Co., New York City.
- Wire Ropes, Steel.**
New Castle Wire Nail Co., New Castle, Pa.
Washburn & Moen Mfg. Co., Worcester, Mass.
Whitney, A. R. & Co., 17 B'way, N. Y.
Wolff, R. H. & Co., Ltd., 118th Street and Harlem River, N. Y.
- Wire Rope, Iron and Steel, Makers.**
Broderick & Bascom Rope Co., St. Louis, Mo.
California Wire Works, San Francisco.
Hazard Mfg. Co., Wilkesbarre, Pa.
A. Leschen & Sons Rope Co., St. Louis.
Trenton Iron Co., Trenton, N. J.
Washburn & Moen Mfg. Co., Worcester, Mass.
- Wire Rope Machinery.**
Kay, J. F., Passaic, N. J.
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Cleveland Wood Turning Co., Cleveland, O.
- Wood-Working Machinery.**
Fay, J. A. & Co., Cincinnati, O.
Seneca Falls Mfg. Co., Seneca Falls, N. Y.
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Bemis & Call Hardware & Tool Co., Springfield, Mass.
Billings, Spencer & Co., Hartford, Conn.
Coes Wrench Co., Worcester, Mass.
Trimont Mfg. Co., Roxbury, Pa.
Walworth Mfg. Co., Boston, Mass.
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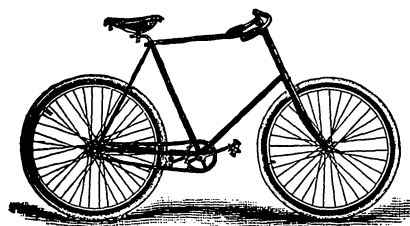
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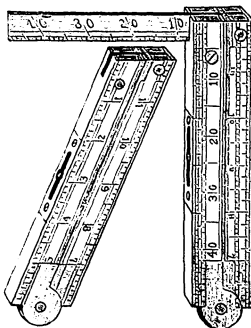
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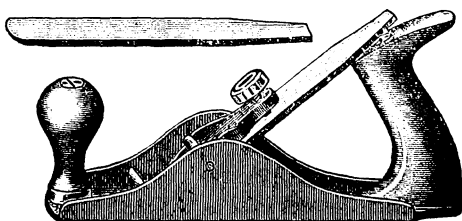
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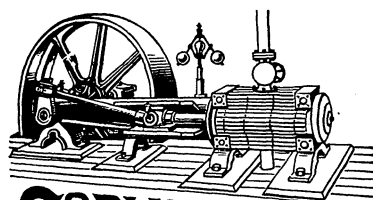
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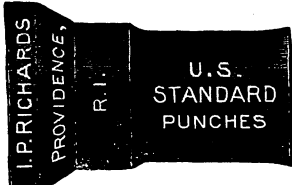
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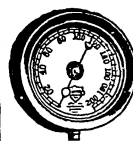
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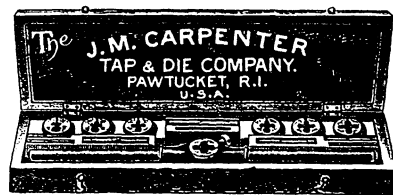
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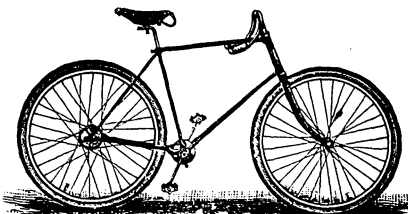
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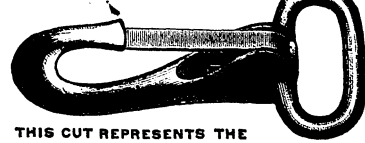
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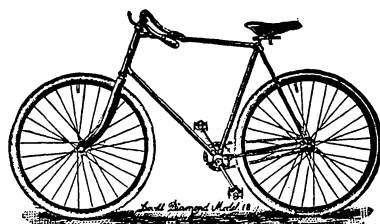
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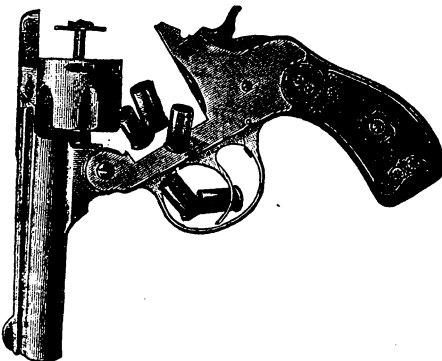
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THE IRON AGE

THURSDAY, NOVEMBER 22, 1894.

Hydraulic Steering Gear on the U. S. S. "Olympia."

From a paper on "Hydraulic Power for Warships," read by A. W. Stahl, Naval Constructor United States Navy, at the meeting of the Society of Naval Architects and Marine Engineers, we take the following description of the hydraulic steering gear on the U. S. S. "Olympia:"

Among the principal operations to be performed by direct acting hydraulic cylinders is the steering of the ship;

part of all future designs of vessels for our navy. The steering gear of these two ships is identical except in very minor details, the difference of power required by the higher speed of the "Olympia" being almost exactly counterbalanced by that demanded by the greater rudder area of the "Oregon." So successful has the steering gear of the "Olympia" proved itself on her several official and inofficial trial trips, that it may be interesting to examine it somewhat in detail.

Figs. 1 and 2 show the general arrangement of the hydraulic gear in the tiller

each cylinder is connected by a pipe with the after end of the other cylinder, each of these pipes being directly connected, without any intervening valves, with one of the two pipes L and M leading to the valve chamber of the differential controlling gear. These pipes operate as supply and exhaust pipes alternately, according to the direction of motion of the rudder.

The function of the differential valve gear relates exclusively to the distribution of the water; its detailed manner of action will be explained presently. Both ends of each main

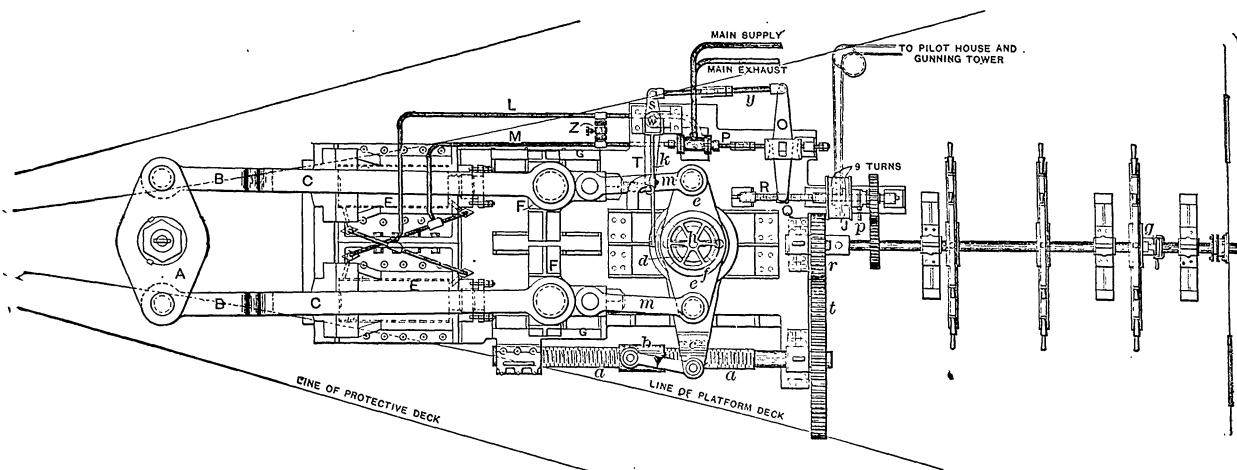


Fig. 1.—Plan.

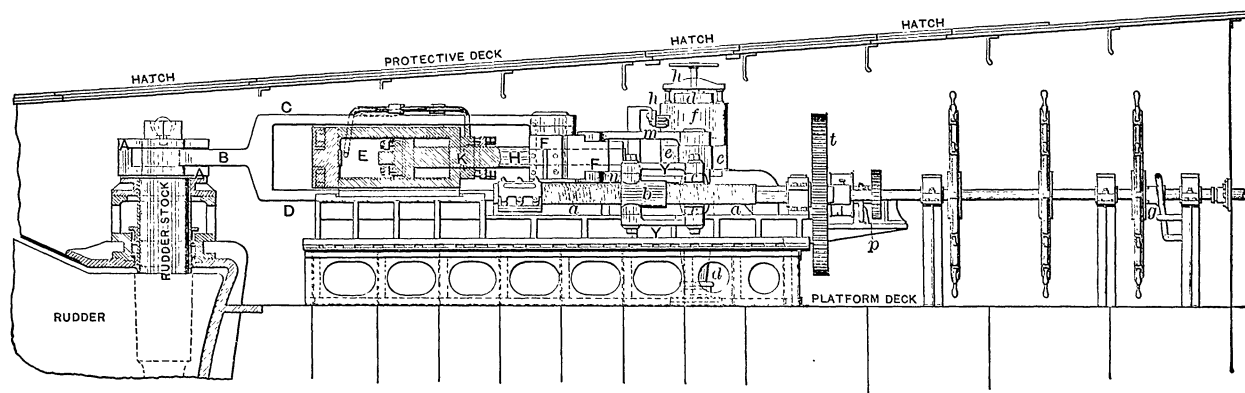


Fig. 2.—Vertical Longitudinal Section.

HYDRAULIC STEERING GEAR ON THE U. S. S. "OLYMPIA."

and we will begin with the consideration of this subject, especially as it can be spoken of as a satisfactorily accomplished fact rather than a proposed experiment. Of the five vessels built for the United States Navy by the Union Iron Works of San Francisco, four have been fitted with hydraulic steering gear of the same general design. Slight imperfections of design that were found to exist in this gear as applied to the "Charleston" and "Monterey" have been remedied in the "Olympia" and "Oregon," and it may be fairly claimed that in the steering gear of the latter two ships simplicity, strength, ease of manipulation and reliability have been attained to such a marked degree as to justify the opinion that this or a similar type of machinery should be made a

room. To the top of the rudder stock is secured a heavy cross yoke, A, at right angles to the plane of the rudder. To each end of this yoke is attached a connecting rod, B, having two branches, C and D, passing above and below the hydraulic cylinders E respectively, and having their forward ends attached to the blocks F. These blocks move in fore and aft guides, G, and form the cross heads to which the forward ends of the piston rods H are attached, the after ends of the latter being secured to the pistons K, moving in the hydraulic cylinders. This is all there is of the main gear, the remaining portions of the complete apparatus consisting of the valve gear for controlling the distribution of the water and of emergency arrangements for steering by hand. The forward end of

cylinder being full of water, the pipe leading to the after end of the starboard, and the forward end of the port cylinders, is caused by the differential gear to be connected with the full hydraulic pressure, while by the same action the pipe leading from the other ends of the cylinders is connected with the exhaust or drain. The result is a motion of the rudder to starboard, and the converse action of the differential gear sends the rudder to port. The diameter of the cylinders, supposing the length of the rudder yoke to be fixed, is determined by the area and shape of the rudder, the maximum speed of the ship and the maximum angle of the helm. The length of stroke depends on the maximum angle of helm, which in this case is 35° each way.

Let us now examine into the action of this differential controlling gear.

The controlling and distributing valve in this gear consists of a small slide valve moving across two circular ports. The ports, in fact, are simply two holes drilled in the bottom of the cylindrical valve chamber and extending up through the flat valve seat. The pipes L and M above mentioned as leading from the cylinders to the valve chamber are screwed into the lower ends of these port holes. The main supply pipe from the pumps enters the valve chamber on the side above the valve, while the exhaust or drain pipe leading back to the supply tank leaves the valve chamber by an opening in the center of the valve seat under the valve.

The controlling valve is caused to move by the action of a floating lever O, pivoted near its center to the valve stem P, the inboard end of this lever being provided with a nut, Q, which works on the screw R. The revolution of this screw is accomplished in various ways, according to the point from which the ship is being steered. If the steering is being done from the pilot house or conning tower, the screw is revolved by means of a drum, J, securely fastened to the screw shaft and having wound about it in many turns a small wire rope, which leads upward and forward over sheaves, and is finally similarly wound round a vertical barrel located under the protective deck and connected with the wheels above referred to. If the ship is being steered from the after wheels on deck or from the wheels in the tiller room itself, the screw is revolved by a pinion on its shaft gearing with another pinion on the wheel shaft. Either of these methods of driving the screw can be thrown into or out of use by the clutch Z.

The screw shaft being revolved by the motion of any one of the various steering wheels, the nut Q on the end of the floating lever O is caused to move forward or after, as the case may be, and the middle portion of the lever and consequently the valve stem and the controlling valve partake of the same motion in a less degree. The water being thus turned into one of the pipes L or M and the other of these pipes being connected with the drain or exhaust, the pistons in the main hydraulic cylinders are caused to move, carrying with them the connecting rods, the rudder yoke and the rudder.

Having thus started the rudder in the required direction it now remains to stop it when the desired angle of helm is reached. This is accomplished by imparting to the outboard end of the floating lever O a motion opposite in direction and so proportioned in amount to that originally imparted to its inboard end as to bring the controlling valve back to its original middle position and thus close off both pipes. The detailed method of imparting this second motion is evident from the drawings. The outboard end of the floating lever is connected by the rod Y to an arm, S. A second arm, T, is connected by a link to the end of one of the main hydraulic piston rods. When these two arms, whose centers of motion are vertically over each other, are connected and caused to move together by the clutch W (as they always are when the hydraulic gear is in use) the motion of the rudder, acting through this piston rod, causes a sufficient movement in the outboard end of the floating lever to close the ports of the distributing valve, and thus stops the action of the mechanism. While this compound

action of starting and stopping just described really consists of two entirely separate and distinct operations, yet the closing of the valve follows rapidly after its opening; so that the practical effect of the whole arrangement is that the rudder closely follows the motion of the steering wheel. As the wheel moves, the rudder moves; as the wheel stops, the rudder stops; the action of the rudder being slightly, but very slightly, later than that of the wheel.

For beauty of conception and rapidity and accuracy of action, this differential controlling gear leaves little to be desired. The final adjustment of its motion is made, after fitting the entire machinery in the ship, by simply adjusting the lengths of the rods P and Y (each of which consists of two pieces) by means of the right and left handed nuts and their jam nuts.

As above stated, we may steer by hydraulic power from the pilot house and conning tower, from wheels under the after bridge, or from wheels in the tiller room itself. So long as the hydraulic gear in the tiller room remains uninjured we have in these four different points from which the gear may be operated a very considerable element of safety; but this, it is only fair to add, is not an inherent advantage of hydraulic gear, but may be, and is, as readily applied to other types of steering gear.

As a further element of safety, this steering gear is provided with two pumps and two supply tanks, one set being located in each main engine room. One pump only is required to be used at any time; and the pipe connections are so arranged as to permit of rapidly shifting from the one pump to the other, in case of necessity.

If both pumps, or the pipes, or the differential gear, or some other essential portion of the hydraulic gear, become disabled, it becomes necessary to steer by hand; and in this emergency it is very desirable that the change from hydraulic to hand gear be made with great rapidity, as the vessel is more or less unmanageable during the interval.

The "Olympia" can be steered by hand from the wheels under the after bridge or from the wheels in the tiller room, the shafting of these two sets of wheels being connected at will by the clutch G. The shaft of the lower steering wheels drives the hand gear direct by means of the two gear wheels r and t. The revolution of the steering wheel shaft thus causes the revolution of the heavy screw A. On this screw works a nut B, secured by the link Y to one end of the arm C, the other end of the latter being firmly secured to the vertical spindle D. Revolution of the steering wheel shaft thus imparts to this spindle a slow motion about its vertical axis. Just above the arm C, and revolving freely on the spindle D, is the yoke E, the ends of which are connected by links m and n to the blocks carrying the ends of the respective main hydraulic piston and connecting rods. This yoke thus partakes at all times of the motion of these rods, and, in fact, always keeps parallel to the main yoke A. At the upper end of the spindle D, and connected to it by two vertical keys so that it may slide up and down freely, but cannot revolve except with the spindle, is the clutch F. This clutch when down locks with the yoke E, and thus transmits the motion of the spindle through this yoke and its links to the main connecting rods and thence to the rudder. The clutch is moved up or down, as desired, by means of the

screw H, and the vertical movement of the clutch is transmitted by the lever K to the smaller clutch W, thus closing off the hydraulic gear when the hand gear is in use, and *vice versa*. A bypass valve, Z, is fitted to permit the water to circulate between the two ends of each cylinder when the hand gear is in use.

The rudder is at all times, whether operated by hydraulic or by hand gear, held firmly by the water which fills the hydraulic cylinders on both sides of the pistons, and this not only prevents the rudder from being moved by the impact of the waves while everything is in good working order, but also prevents injury to the rudder from this cause in case the steering gear is injured or partly destroyed, provided one hydraulic cylinder remains wholly or nearly intact.

The entire steering gear has worked admirably under all the severe tests to which it has been subjected; and having been designed to meet certain extreme conditions as to strain, it may, I think, be depended upon for many years as a thoroughly serviceable, effective and reliable apparatus.

In these times when the news printed in the daily press, and particularly that relating to industrial matters, is so highly colored one way or the other, according to the political beliefs of the papers in question, it is wise not to put too much faith in printed statements to the effect that this or that establishment has started up after a suspension of anywhere from three months to a year and will run to full capacity right along. Again, it is not always best to accept as truth the statement appearing almost daily, that on account of the result of the recent elections wages at a certain establishment have been advanced 10 per cent. or even more than that amount. Two cases that came up in Pittsburgh last week well illustrate the point in view. One was to the effect that a prominent bar iron concern had voluntarily increased wages of their puddlers 10 per cent., and the papers that train with the party that won such a victory recently took occasion to make a great ado about it. The other was to the effect that a large tube concern, whose plant had been entirely closed for six months, would resume at once, giving employment, some accounts stated, to 1000 men. The resumption was attributed entirely, of course, to the recent elections. Investigation proved unfortunately that the firm credited with giving their puddlers an advance of 10 per cent. knew nothing about it, and the item was what is commonly known as a "fake." The tube concern in question have been closed for some time, but have put on a few men to get out some special work, and whether they will continue to run in part or not, depends on their getting some orders, which, up to this time, they have not received. Only a short time ago a communication was received from a concern building rolling mill and tin plate machinery, requesting that no attention be paid to a statement that was being industriously circulated to the effect that they had received an order for the building of a tin plate mill, all on account of the "great victory." While it would be a very great pleasure to chronicle news of this kind, stripped of its political features, investigation proves too often that its only foundation is in the brains of some imaginative reporter.

Society of Naval Architects and Marine Engineers.

Second Convention.

The second meeting of the Society of Naval Architects and Marine Engineers was held on the 15th and 16th insts., at the house of the American Society of Mechanical Engineers, which is now the national headquarters of the young society. The sessions were well attended by naval engineers and constructors, by officers of the navy and by prominent mechanical engineers interested in the subjects discussed by this society. Among those present were the following:

Clement A. Griscom (president), president of the International Navigation Company, Philadelphia; Washington L. Capps (secretary-treasurer) Assistant Naval Constructor, Washington; Charles H. Cramp, president Wm. Cramp & Sons' Ship and Engine Building Company, Philadelphia, Pa.; William H. Webb, New York; William H. Jaques, New York; Edwin A. Stevens, Hoboken, N. J.; Francis Tiffany Bowles, Naval Constructor, Navy Yard, Norfolk, Va.; Irving Cox, 1 Broadway, New York; Edwin S. Cramp, superintending engineer Wm. Cramp & Sons' Ship and Engine Building Company, Philadelphia, Pa.; William M. Cramp, Philadelphia, Pa.; Frank L. Du Bosque, assistant engineer, floating equipment, P. R. R., Jersey City, N. J.; Charles Edward Emery, consulting engineer, New York; Frank L. Fernald, naval constructor, Navy Yard, New York; H. S. Hayward, superintendent motive power, Pennsylvania Railroad, Jersey City, N. J.; J. F. Holloway, mechanical engineer, New York; David S. Jacobus, Assistant Professor Experimental Shopwork and Mechanics, Stevens Institute, Hoboken, N. J.; John C. Kafer, superintendent Morgan Iron Works, New York; Leopold Katzenstein, mechanical engineer, New York; Frank B. King, superintendent marine department, Maryland Steel Company, Sparrow's Point, Md.; Frank E. Kirby, naval architect Detroit Dry Dock Company, Detroit, Mich.; Charles Harding Loring, ex-Engineer-in-Chief U. S. N., Brooklyn, N. Y.; Edward A. Magee, Chief Engineer U. S. N., Washington; George W. Melville, Engineer-in-Chief U. S. N., Washington, D. C.; J. G. Arnold Meyer, editor *American Machinist*, New York; Walter Miller, chief draftsman Globe Iron Works, Cleveland, Ohio; William L. Mintonye, naval constructor, Brooklyn, N. Y.; Charles Dell Mosher, mechanical engineer, New York; Lewis Nixon, superintending constructor Wm. Cramp & Sons, Philadelphia, Pa.; John F. Pankhurst, vice-president and general manager Globe Iron Works, Cleveland, Ohio; Cecil H. Peabody, Associate Professor Marine Engineering, Massachusetts Institute Technology, Boston; Charles E. Richson, chief draftsman construction and repair department, Navy Yard, New York; Edwin Beale Sadler, chief draftsman hull department Harlan & Hollingsworth Company, Wilmington, Del.; William R. Sadler, mechanical engineer, Navy Yard, New York; Horace See, naval architect and marine engineer, New York; T. Jackson Shaw, superintending engineer Harlan & Hollingsworth Company, Wilmington, Del.; E. Platt Stratton, mechanical engineer, manager American Shipmasters' Association, New York; John G. Tawressey, assistant naval constructor, Philadelphia, Pa.; Stevenson Taylor, vice-president and general manager W. & A. Fletcher Company, Hoboken, N. J.; Philip R. Voorhees, New York; Frederick M. Wheeler, secretary Geo. F. Blake Mfg. Company, New York; Theodore D. Wilson, ex-Chief Constructor U. S. N., Washington; Joseph Janvier Woodward, naval constructor, Newport News Shipbuilding Company, Newport News, Va.; Emmanuel Cheneau, Philadelphia; Henry L. Gantt, Philadelphia; Samuel Dana Greene, 43 Broad street, New York; Hugo Hammer, construction and repair department, Navy Yard, New York; C. Kirchhoff, editor *The Iron Age*, New York; Richard Worsam Meade, Rear-Admiral U. S. N., Washington, D. C.; Jacob William Miller, president Providence & Stonington Steamship Company, New York; George L. Norton, editor *Marine Journal*, New York; H. G. Prout, editor *Railroad Gazette*, New York.

The balloting for officers for the ensuing year resulted in the reelection of the present incumbents. The report of the council showed the society to be in a very flourishing condition, there being a membership of 440, including those admitted at the present meeting, and a surplus of \$4700 in the treasurer's hands.

President's Address.

President Griscom, in his address, said, in part:

In a brief introductory address it is not my intention or desire to burden you with any statistics of shipbuilding progress during the past year; indeed it would be a mournful recital, for this branch of industry has suffered severely from the general depression that has prevailed throughout our land, but, from papers announced to be read, you will doubtless derive some very definite ideas as to what we need for the development of our naval and mercantile marine. The naval battle which has recently occurred in the war between Japan and China is of surpassing interest, not only to naval men and members of this society, but also to our citizens in general, as establishing the value and necessity of an adequate naval force. The information at present at hand, though sufficient to arouse some controversy as to the value of types of ships, cannot be regarded as sufficient to form an opinion or even to lead to serious question as to the relative advantages of battle ships and cruisers. It will be necessary to have accurate information in regard to more than one battle before the confidence of naval men is in the least shaken in the greatly preponderating efficiency of armed vessels.

There are points of the highest and most essential value, however, brought out by the battle of the Yalu River. Those which most impress me are the immediate strategical and actual results, due to the fact that Japan possessed a large and capable modern fleet, and that it was thoroughly prepared for actual service, not only with munitions of war but also with skillful and well trained officers and men. These are the lessons which can be brought home to our countrymen. It should be understood that a modern naval force, with all its multitude of equipment, arms, munitions and accessories, cannot be produced on the spur of the moment, but is the product of naval architects, steel makers and a host of others whose skill can only be obtained by experience. It must not be overlooked that the personal element in warfare, as in peace, is an all-powerful one, sometimes predominating, sometimes secondary, but always of the greatest importance, and, therefore, an adequate navy is necessary, not only for the actual representation of power and force, but also to secure to our officers and men those superior nautical aptitudes only to be obtained by such continued experience at sea as made heroes of Hull, Decatur and Farragut. The full development of a naval force, however, is not possible unless the growth of the merchant marine has kept pace with the naval development. My quotation of the words of Sir Nathaniel Barnaby in my address to you last year—"No nation could maintain an efficient navy without a prosperous commercial marine to support it"—has still the force of an axiom. And it should not be overlooked that in time of war the conversion of fast mail steamers into armed cruisers is generally recognized among all maritime nations as a most formidable means of offense or defense for any

country so fortunate as to possess them. Moreover to provide the expansion of naval *personnel* rendered necessary in time of war, there must be a well trained merchant marine to draw upon, and those nations which have not encouraged shipbuilding and shipowning in times of peace must inevitably suffer from their shortsighted and narrow policy when confronted with a powerful hostile fleet.

The first paper presented was by Rear-Admiral Meade, U. S. N., entitled:

Some Suggestions of Professional Experience in Connection with the Naval Construction of the Last Ten Years.

Since this paper provoked considerable discussion, particularly that portion criticising the triple screw cruisers which were described in a paper read later in the meeting by Engineer-in-Chief Melville, we shall present abstracts of both papers and combine the discussion, which was for the most part confined to the efficiency and desirability of the three-screw type of war ship.

Admiral Meade said: What is the first military need of this country at the present time? Is it not a perfect defense of the coast? And how shall we be best prepared to defend the coast so far as the navy is concerned? In my judgment, we require, first, and before everything else, coast defense battle ships, harbor defense armor clads, rams and torpedo vessels.

If I had my way, not a single cruiser beyond those already designed, building and built should be added to the navy until at least 20 battle ships, 100 torpedo boats and a suitable number of rams were in readiness for active service. And then let foreign intermeddlers in the domestic concerns of this continent take due warning that the Great Republic has a policy at sea as well as on land, and that it is quite prepared to maintain it. We shall not be aggressive, but we will tolerate no intermeddling. Episodes such as the Bluefields affair could be met in the meantime by the purchase of light draft merchant steamers to be suitably armed with rapid fire guns. This course would be better and in the end cheaper than keeping such large and expensive ships as the "Columbia" on that coast, because the shallow waters necessitate that she be anchored not less than 10 or 12 miles from the scene of action in Bluefields, and therefore she is able to communicate only by steam launches or cutters. Such a state of affairs is pitiable, if not ridiculous. Half a dozen good tugboats armed with rapid fire guns might have finished the Bluefields affair long ago, but we did not have them, and, under the law, there was no power to purchase them for the emergency. This matter ought not to be a question of politics, but of the honor of the nation. In this year of grace 1894 we have on our navy list, building or built, 42 vessels that we call "the new navy." The several types compare favorably with type ships on the other side of the Atlantic, and some of our types are distinctively, we think, superior to those of similar class built in England.

But while the naval construction of the past decade is in the main satisfactory, it is not, I think, entirely satisfactory to the majority of experienced commanders. The vessels that seem to be the least satisfactory to the practical men of our profession are the "Colum-

bia" and "Minneapolis" and the "Detroit" class; the "Cincinnati" class, also, in a less degree, except for coast defense.

And they are unsatisfactory for these reasons: The smaller vessels cannot cruise in time of war, except in home waters; and as to the larger ones, such as the "Columbia," it is feared that vessels like the "Majestic" and "Teutonic," for instance, may laugh at our three screw racers, which cannot cross the ocean at the same speed these commercial greyhounds maintain year in and year out. Moreover, as to the question of fighting, I doubt very much the superiority of the "Columbia" over the American liner "New York," the latter suitably armed as she would be in the service of the Government; while, as to coal capacity, the "New York" or "Paris" of the American Line are by far the superiors of the "Minneapolis" and "Columbia," and already many thinking men believe that the third screw is nothing more than a very expensive experiment, which we will not be in a hurry to repeat. These high speed commerce destroyers can as well be obtained from the merchant marine in time of war as from the navy; better, indeed, for the conditions are such that the merchant steamer is far more apt to be perfectly ready for her work when wanted. The question of mounting guns and furnishing ammunition is one of a few days only. We all remember the remarkable celerity with which a couple of fast merchant steamers were equipped recently for the service of Brazil in dealing with her insurrectionists.

A perfect condition of steam machinery and hull are far more important matters than the mounting of guns, which is a question of only a few hours if the guns are ready. The conditions of naval service in days of peace are such that I am reasonably certain that the fast merchant steamer, except as to her armament, will be found nearer ready to "sink, burn and destroy" than the *soi disant* very fast man of war. The practical men of the navy will fully understand what I mean by this. It is not a reflection on any one, but it is due to the conditions of peace service in the navy.

The criticism that is most frequently put forward in regard to the construction of the last ten years is that, lacking a well defined policy that administrations should be bound to maintain, the designs have been haphazard, dependent on the whim of individuals and the caprice of Congress.

This is, of course, greatly to be deplored, for in these days a navy, with almost absolute truth, may be likened to an army in the field, which is made up, as most persons know, of different arms, each having its specific and well defined purpose to fulfill. Though naval opinion varies considerably it is in the main agreed upon to-day by naval men that an efficient fleet for modern warfare should be composed of the following integral parts:

1. Armored ships for coast defense;
2. Armored ships for harbor defense;
3. Armored cruisers;

the battery and torpedo outfit being of the heaviest and most effective character possible, and all the vessels built with a view to ram when necessary.

2. Rams of great speed and handiness, partially protected by armor belts and armor bulkheads in wake of the engines and boilers, the battery to be merely nominal, the ram to be the chief weapon.

3. Torpedo vessels of at least three

classes, A, B and C. Class A to be known as "torpedo catchers," or, as the French have it, *torpilleurs de haute mer*. The smaller classes, B and C, for coast and harbor defense.

4. Cruisers of very great speed under steam and with a large capacity for coal and stores, giving a great radius of offensive action. I do not hesitate to say that these vessels should be drawn exclusively from the merchant marine, which vessels I should class as the "fourth reserve." The conditions of ordinary cruising in time of peace for vessels of the regular navy are such that these ocean greyhounds are of little or no use to the navy except in time of war. The short voyages and the long stay in port in time of peace, combined with the great cost of maintaining such expensive vessels in commission, are quite enough to demonstrate the strength of my argument.

5. Cruisers of moderate speed under steam, say 14 or 15 knots, rigged with three or more masts and fitted to carry large fore and aft sails as auxiliaries to steam, very useful in such waters as the Pacific, where long distances must be traversed and where coal is not only scarce, but very expensive. This class of vessels should, in my opinion, be of composite construction, transversely, of steel with longitudinal stringers, longitudinally planked and coppered. I do not think such ships need an inner skin of steel, though the larger ones might have it extending to the water line. This is a class of ships that the United States Navy needs most at this time, and it seems passing strange the Government has not even one in commission.

6. Gunboats of light draft, composite build, and limited rig for canvas, with fair speed under steam, say 11 knots, well armed with rapid fire guns and to draw not over 10 feet at the load line—such vessels are the pressing necessities of the hour. It is only necessary to refer to recent events in China and Central America to show how large sums of money could have been saved had our navy possessed some half a dozen such vessels. For service in shallow waters and rivers such vessels are invaluable as aids to the heavier vessels.

7. Store ships, harbor training ships, practice vessels, receiving ships, dispatch vessels, bomb vessels and tugs, both sea going and harbor tugs. And with a navy built up on the lines indicated questions as to stagnation in promotion might not arise, I think.

The paper then gives more in detail the qualities these vessels should possess and dwells upon the necessity of rebuilding and rehabilitating the American merchant marine.

Engineer-in-Chief Geo. W. Melville's paper on

The United States Triple Screw Cruisers "Columbia" and "Minneapolis"

was in part as follows:

When I was asked to design machinery of about 21,000 indicated horsepower for the "Columbia," there were a number of questions which came up for consideration. One was that of securing economy at moderate speeds when full speed was so high, and another was that of the shafting. When the design was under consideration no steel shafting had yet been made in this country for the transmission of as great a power as 10,000 horses, and, while I had every confidence in my friend John Fritz and the Bethlehem Iron Company, I felt that it would be safer to adopt a design which would give us smaller

shafting. The alternative to triple screws was twin screws, either with one very large engine or two smaller ones on each shaft. The former meant large parts of the machinery all through, and the latter great multiplication of parts.

It is obvious that, even if the drag of the two idle screws should require enough additional power to make the actual cost of propelling the vessel at a given speed in pounds of coal per hour nearly as great as the similar cost of driving her by the after engines of twin screws with a pair on each shaft, there is a gain in economy of maintenance and in convenience. We have been compelled in the "New York" and the "Brooklyn" to make special provision for the wearing down of the shaft bearings of the after engine, and in the "Blake" of the English Navy, where the attempt has been made to avoid this difficulty by using the forward and after engines on each shaft alternately, it is necessary to disconnect all the connecting rods and eccentric straps, which is certainly inconvenient, and involves considerable delay when it is desired to use both engines for higher powers.

When the "Columbia" and the "Minneapolis" were designed we hoped to secure a speed of about 22 knots for the maximum indicated horse-power of 21,000, and while some enthusiasts predicted higher speeds, those of us who were more conservative felt that 22 knots was about all that we could reasonably expect. The news that the "Columbia" had made 22.8 knots was, therefore, both gratifying and astonishing when the official report showed that it had been made for only about 18,500 indicated horse-power. After this performance it was, of course, reasonable to expect still better results from the "Minneapolis" if she should develop the full 21,000 indicated horse-power, and, as you know, such was the case, an average speed of 23.07 knots being secured, making her the fastest large vessel in the world, and, for the length of her trial, the fastest vessel, large or small.

In an appendix to the paper are given the dimensions of hull and machinery of the "Columbia" and "Minneapolis," together with the data of their performances on trial. There is also given a brief historical sketch of the use of multiple screws.

As already remarked, the economy of propulsion in the case of the "Columbia" was so marked as to suggest comparison with other fast vessels, and it was at once apparent that the gain in economy was considerable. A natural comparison is with the "New York" and the "Olympia," and I have brought the "New York" and the "Minneapolis" to the displacement of the "Olympia" by Froude's law.

Applying Froude's law, and bringing the speeds of "Olympia" and "New York" to that of the "Minneapolis," we get the results shown in the accompanying table.

When such a gain as this is shown, the most natural thing is to search for the cause, and here we are met with obstacles at the very start. Probably, after some consideration, the first suggestion would be that the centre screw is very favorably placed for securing whatever benefit there may be from working in the forward current of the frictional wake. This would doubtless be accepted but for the fact that most of the authorities on screw propulsion have stated that while the screw itself would be helped, any gain in this direction would be offset by the increased resistance of the vessel due to the action

of the screw interfering with the stream line action. It should be said, however, that most of the authorities simply state this as a proposition, without attempting any demonstration or quoting experimental data to confirm the statement.

When the "Columbia" was designed there was a general belief that the race from the side screws would cause the center screw to work in water having a sternward motion, and it was the intention to give it about 10 per cent. more pitch than the side screws. However, before the "Columbia" was tried, it was learned that the trials of the "Kaiserin Augusta," the German triple screw vessel, had shown that, if

times; that we couldn't build as good ships as they did abroad, and so on to the end of the chapter. Now we have beaten our foreign friends, and we are told that fast ships are useless. It seems to me that the idea so cleverly put by my friend Nixon of Cramp's in regard to battle ships, is equally true of fast cruisers. Explaining why we should not rely on monitors alone, he said: "You can't get as much fight out of \$2,000,000 as out of \$5,000,000." So it is with these fast cruisers. We don't want our navy to consist of them alone, and as I said here last year, I believe, for mere peace cruisers, we have oversped many of our ships; but in time of war I believe there is a great field for

tonic" or "Majestic" out of the harbor and to catch her, if possible, before she reached the other side. "And the Admiral will be on board to take the responsibility and see that steam is kept up."

The following papers were also read: "The Use of Small Models for the Determination of Curves of Stability," Mon. E. Bertin, Director of the French Government School of Naval Design; "Some Obstacles to Shipbuilding and Owning in this Country," Geo. W. Dickie, San Francisco, Cal.; "Present Status of Face Hardened Armor," W. T. Sampson, Captain and Chief of Ordnance U. S. N.; "Cellulose and its Application to War Ships," Mon. E. Cheneau, Philadelphia, Pa.; "Experience Gained with our New Steel Ships as Regards Care and Preservation," Philip Hichborn, Chief Constructor U. S. N.; "Electricity on Shipboard—Its Present Position and Future Development," S. Dana Greene, New York; "Hydraulic Power for War Ships," Albert W. Stahl, Naval Constructor U. S. N.; "Yachts in England and America," Lewis Nixon, Philadelphia, Pa.; "A Dynamic Steam Engine Indicator Tester," Prof. Cecil H. Peabody and Assistant Prof. E. F. Miller, Massachusetts Institute of Technology; "Notes on Launching," William J. Baxter, Naval Constructor U. S. N.; "Accessibility and Circulation of Water Tube Boilers," L. B. Davis, Erie, Pa.; "Recent Light Draft Gunboats of the United States Navy," J. J. Woodward, Naval Constructor U. S. N.

San Francisco News.

SAN FRANCISCO, November 12, 1894.

The Oakland side of the Bay of San Francisco has for many years been growing in importance as a seat of manufactures, partly for the reason that land was cheaper than in the metropolis, and that it did not therefore require so much capital for preliminary expenses as at this side. So quietly and unpretendingly has the process been going on, however, that a great many of our citizens are only waked to the realization of what their sister city is doing until something like a big fire or other similar occurrence arouses them from their lethargy. Very few people on this side of the bay recked of the existence of a flourishing iron industry in Oakland till the fire of October 31. By that fire the machine shops of the Oakland Iron Works were ravaged. The wooden walls of the institution burned like tinder. The loss was \$20,000, including \$15,000 in machinery. The machine patterns were, however, in a fire proof brick building and escaped damage. The insurance was \$11,000, so that quite a severe loss has been experienced. The institution has been quite enterprising and has kept many valuable contracts from going East. When running full force it employs 110 men, and even at the time of the fire had 90 men employed. Work is continued pending rebuilding, as the needed space, &c., has been found in a brass foundry opposite. Through many similar institutions our sister city is fast working up a reputation for herself as one of the leading seats of manufacturing industry on the coast, and owing to this it is becoming quite a market for machines of various kinds itself, or perhaps I should rather have said Alameda County, which contains, besides its iron works and foundries, beet sugaries, oil refining works, the greatest on the coast, an agricultural machinery factory, car works, &c.

	"Minneapolis."	"New York."	"Olympia."
Trial displacement.....	7,347.5	8,480	5,586
Length on load water line.....	411.6	380.0	340.0
Beam.....	58.2	64.25	53.05
Mean draft.....	22.5	23.9	20.78
Block coefficient.....	0.478	0.509	0.517
Trial speed.....	28.07	21.00	21.686
Trial indicated horse-power (main engine)....	20,366.2	16,917.3	16,849.8
Reduced displacement.....	5,586	5,586	5,586
Reduced speed.....	22.00	19.60	21.686
Reduced indicated horse-power.....	14,750	10,400	16,849.8
Indicated horse-power for 22.00 knots at reduced displacement.....	14,750	16,500	17,847
Percentage of gain in economy of propulsion of triple screws over twin screws.....		11.9	21.00

given such an increase of pitch, the center screw could not work up to the designed number of revolutions. When the Columbia was tried all the screws were given the same pitch, 21 feet 6 inches, but the center screw ran some five revolutions per minute slower than the side screws and the mean effective pressure of its engine reduced to the low pressure cylinder was nearly 3 pounds more than that of one of the side screws. In the case of the "Minneapolis," the pitch of the center screw was set at 6 inches less than that of the side screws (21 feet 6 inches and 22 feet) and ran about one revolution faster than they, with an aggregate mean effective pressure greater by 3 pounds and nearly 700 more indicated horse-power. Now, clearly, this can only be explained by assuming that the forward wake exerts a very strong pressure, and, as we have the undoubted facts of the high speed and moderate horse-power, the action of the screw cannot have interfered with the stream line action enough to increase the resistance of the ship.

Thus it seems to me that the most reasonable explanation of the increased economy of propulsion is that in an unusual degree the center screw, which occupies the same position as the propeller in single screw vessels, profits by the forward motion of the frictional wake and this without interfering with the stream line motion sufficiently to increase the vessel's resistance.

As has been already stated, it was not anticipated, when triple screws were adopted, that their use would give any increase of economy of propulsion, their adoption being due mainly to constructive reasons, and incidentally to secure economy at cruising speeds. It appears now, however, that this method does give an increase of economy at maximum powers. It would seem, therefore, that for very high speed ships this arrangement would commend itself, and, if it were not dangerous to prophesy, I should be prepared to anticipate the adoption of triple screws for all the new "flyers" that enter for the transatlantic race.

It seems very hard to satisfy our critics. Before we began the building of our new navy it was constantly hurled in our teeth that we were behind the

just such ships as our triple screw cruisers—the fastest vessels now afloat.

Discussion.

In reply to the criticism of Admiral Meade, that "the designs have been haphazard, dependent on the whim of individuals and the caprice of Congress," ex-Engineer-in-Chief Wilson stated that the ships of the new navy were the work of a board and that the whim of any particular individual was not apparent.

Concerning the statement that merchant vessels could be fitted for war purposes in a few days, Mr. Kafer of the Morgan Iron Works made some interesting remarks about the changing of merchant vessels into war ships. During the late trouble in Brazil he was asked how long it would take him to transform two merchant ships into cruisers for that country. He calculated that 20 days would be required. The work was done in 15 days, and two-thirds of this time was taken up in fitting and placing the guns. From his experience in this case he did not believe the transformation could be made of any merchant ship in 48 hours. The fact was also brought out that this work was done in New York, where all necessary supplies could be quickly obtained, and where skilled labor was plentiful.

Concerning the triple screw cruisers Admiral Meade said that in view of the great cost of these ships they do not do as good service as others of a different type. Two screws were better in service, because they could be handled quicker and to better advantage. The Admiral also dwelt upon the fact that the navy can never bring the ships to the same condition as Mr. Cramp when he tests them. Then they are provided with picked coal, a trained crew, everything loosened up and oil flowing like water. It had not been possible, in the service, to obtain a speed of over 21 knots. The Admiral stated that if he was not interfered with he would try an experiment that would demonstrate the true qualities of the ships. He would have the "Columbia" or "Minneapolis" cleaned, furnished with the best coal and crew available and would keep her under steam in New York Harbor. The commanding officer would be instructed to follow either the "Teu-

The pulse of trade continues to beat stoutly despite the waning year, and the volume of business in most of the leading lines, including among them, of course, those in iron, steel and hardware, may be said to be comparatively good. This comes from the fact that fruits and grain alike have been harvested late and that the distribution of money in the country, long delayed, is now going on and making things brisk. This is the time for improvements if they are ever made during the year, and there is considerable activity in this direction. The demand for building hardware is fair for this time of the year, but, of course, from now on trade will begin to wane till it reaches its apogee in three or four weeks hence. There have been good rains, though they have not fallen continuously, but they have been sufficient to put the ground everywhere into good shape for the labors of the farmer, and where sowing has been done they have benefited the early sown grain much. All are encouraged and there is still some demand for agricultural implements both of Eastern and California make. Arrivals by rail are, however, light. There has been an increase in the arrivals of hardware, pipe, machinery, &c., by rail, the quantities being much larger than they were a couple of weeks since. This is partly due to the increased demand, partly to the fact that very soon rail shipments will be liable to interruption from the weather. Arrivals by sea have been of fair volume. The "St. Paul" and the "Geo. Stetson" have had some heavy consignments of bar and bundle iron, &c., besides hardware and steel, but the heaviest consignment of iron reaching this port for many a year came to hand by the "Scottish Dales," 43,599 bundles and 620 bars of iron from the Continent of Europe. This may be considered the first fruits of the new tariff as, of course, this large quantity was shipped in anticipation of its passage.

The two clippers mentioned before brought to hand 450 tons of American pig iron, making about 5500 tons of Eastern since the beginning of the year. No foreign of any importance has come to hand for a long time, whatever may be the case now. There has been no change in prices since I last advised *The Iron Age*. What with dullness of the foundry business and imports by foundrymen themselves by rail pig iron may be regarded as a drug on the market.

Imports of nails have been large during the fortnight, 7700 kegs by sea and about 3000 by rail, altogether a very decent supply for the time for this season of the year. The price has not varied a particle in some time. Pig tin and tin plate continue to be in light demand. The price of Australian tin is 16½ cents, while coke tin is worth \$4.65.

The returns of the United States Bureau of Statistics show a large increase in exports of domestic merchandise for the month of October as compared with September. The exports during October were \$82,291,250, against \$57,811,087 in September. The total exports during the ten months ending October 31, 1894, have been \$644,570,000, which is about \$28,000,000 less than the figures of the first ten months of 1893. The excess of exports over imports in the same period has been nearly \$97,000,000. This fact is regarded as providing a safeguard against any extensive loss through gold exports in the near future.

The Cornwall Ore Hills.—III.*

BY JOHN BIRKINBINE, PHILADELPHIA.

Present Status.

The ore in the three mills, known as "Big," "Middle" and "Grassy," exhibits a continuous exposure 4400 feet in length and a breadth of from 350 feet to 800 feet; originally the elevations of the hills above the creek were respectively 326 feet, 148 feet and 123 feet, but these have been greatly reduced. Drill holes indicate ore to a depth of from 200 feet to 300 feet below the creek level in certain portions of the deposit. There is therefore no immediate anxiety as to the exhaustion of the deposit, but the Big Hill shows signs of exhaustion, and the necessity of pumping and hoisting elsewhere will be more pronounced in the future.

As previously stated, the general knowledge that two rates prevailed in the sale of Cornwall ore has undoubtedly interfered with its use, for outsiders felt that they were really adding to profits of competitors in iron production by this discrimination. The value of Cornwall ore must be determined for each furnace on the same basis as that of any other ore—viz., by its cost delivered per unit of iron, with credit for its phosphorus and discounts on account of the sulphur requiring roasting, and the copper and gangue; but notwithstanding this, Cornwall ore has been unquestionably at a disadvantage, due to the two rates which prevailed.

The requirements for iron ores have in late years been narrowed in their limitations. Blast furnace managers have been buying what they want rather than what the ore miners wish to sell to them, and these requirements will affect the material won from the Cornwall ore hills, demanding higher standards or closer sorting than heretofore. Modern furnace practice recognize that it is cheaper to "cob" or "beneficiate" ores before using them than to convert the excess of barren material into slag at the expense of fuel, flux, labor and interest at the furnace. It is not improbable that in the future the selected lump ore will be sent to the roasters, the fines and the lean ore cobbled or possibly separated by magnetic concentrating machines, thus materially improving the average yield of ore and decreasing the sulphur and copper. The problem of concentration has never received serious consideration from the Cornwall Ore Banks Company, but individual proprietors have made some investigations and experiments. The character of the gangue makes the concentration problem a difficult one, but the difficulties can in large part be overcome, for the tailings from concentration should be valuable.

Here is an iron ore deposit which, when producing at the average of the last few years, mines annually 10,000 tons of sulphur in the pyrites and 1500 tons of copper, both of which exert a deleterious influence on the ore and which the users of the ore would now gladly throw away to get a purer mineral. In concentration a part, at least, of this might be made to produce value, thus reducing the expense of beneficiation. At the present time it seems that a practical method would be:

1. To sort out as far as practicable the best ore and roast it.
2. Crush to moderate size, and sepa-

* See *The Iron Age*, November 8, page 798, and November 15, page 858.

rate magnetically the lean ore and richer fines so as to secure cobbled ore yielding from 55 to 60 per cent. of iron.

3. Retreat the tailings to get a pyrites sufficiently concentrated for commercial use.

4. Remove as much copper as practicable, and separate the remaining magnetite as far as it can be done.

5. Improve the roasting appliances and methods.

This is merely a suggestive outline subject to modification.

The status of the blast furnaces now using Cornwall ore may be summarized as follows:

The aggregate daily output of the seven active stacks approximates 650 tons, 20 per cent. being mill iron, the balance Bessemer pig. If all the blast furnaces in the Cornwall or Lebanon districts were in blast nearly 1200 tons of pig iron per day would be made, and if these were remodeled the output would be augmented. The Robesonia Furnace is now producing 1000 tons weekly, one stack of the Colebrooke plant is making 800 tons per week, and when the other stack of this plant is remodeled to the dimensions decided upon—viz., 19 x 85 feet—an augmented product is expected. The average fuel consumption is about 2900 pounds per ton of pig iron. Some stacks using all coke show to better advantage, others charging mixtures of coke and anthracite require fuel above the amount mentioned. About 2.15 tons of ore as mined are now necessary to produce 1 ton of pig iron in the furnaces using Cornwall ore exclusively. When mill cinder is used as a mixture with Cornwall ore the proportions are generally as 3 to 1. The flux varies from 25 to 40 per cent. of the ore burden, all but one stack obtaining limestone from quarries immediately at the furnaces. The labor per ton of pig iron averages about \$1.40 including the men employed at the roasters. Any improvement in the yield of the ore will influence the fuel consumed, the flux required, the labor necessary, and increase the output in a given time, thus decreasing fixed charges per ton of product, and advances in metallurgy will show further improvements.

The advantages which nature has bestowed upon the beautiful Lebanon Valley in the magnificent deposit of ore of Bessemer quality at Cornwall, will continue to add to the prosperity of the State of Pennsylvania, probably even more markedly in the future than in the past. A heritage such as this is not to be lightly considered, but is deserving of the fullest utilization and most economic treatment. Until basic steel reaches a production much in advance of the present, or until some other process is discovered which displaces Bessemer steel, the Cornwall iron hills will continue to be a most important factor in the prosperity of the metallurgical industries of the State of Pennsylvania. Although possible, it is not probable that a radical change in the average phosphorus contents of this ore will follow future development, but even if such should be the case few deposits can produce large quantities of ore as cheaply as can be done at Cornwall, and the mineral obtained will be consumed for metallurgical industries.

An arrangement has been made by which representatives of the three existing bondholders' committees of the Atchison, Topeka & Santa Fé Railroad have been constituted a joint Executive Committee for the reorganization of the company.

The Davis & Rankin Company.

The Sinclair-Scott Mfg. Company of Baltimore and the Baker Mfg. Company of Muscatine, Iowa, have been absorbed by the Davis & Rankin Company of Chicago, which practically gives to Chicago a new manufacturing plant, the aggregate cost of which will fall but little below \$500,000.

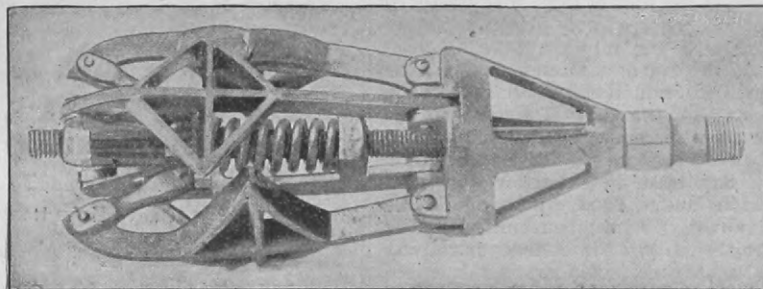
The Davis & Rankin Company have secured a twelve-acre tract of land in Harvey for their purposes, and will proceed at once to cover the property with buildings large enough to house the greatest manufacturing plant of the kind in the world.

The company formerly occupied the seven-story structure that covers nearly a quarter of a block at Lake and Peoria streets as a factory for machinery and articles for the equipment of canning factories, creameries, dairies and butterine factories. Scarcely an article is made use of in the preserving of fruits or vegetables or in the handling of milk and its products that is not turned out by this company. The absorption of the two other leading plants of the kind forms an almost exclusive monopoly of a business the magnitude of which can be judged by the fact that this concern

said, "and has the kind of men at the head that will make it a credit to the town. The volume of business they have already established is great and will undoubtedly be greatly increased. They have been crowded out of their old quarters by the increase of business. Last year they were compelled to refuse orders for 75,000 milk cans, such as are used on trains, because they were unable to fill them at the old factory. Tin plate and sheet steel factories may be added to the industries already established. The Davis family, at the head of the concern, consists of seven brothers, averaging over 225 pounds in weight. They may be said to be 'solid' business men without resorting to figures of speech."

The Weston Flue Scraper.

The Weston flue scraper, manufactured by F. A. Herrick & Co. of Jackson, Mich., is made entirely of malleable iron. It is explained that the action of the coil spring is such that the knives or cutting blades are always kept to the work, thereby making the scraper particularly applicable for cleaning rough, uneven and welded flues. The scraping blades have a shearing cut and will not ride over



THE WESTON FLUE SCRAPER.

alone have supplied more than 1200 complete outfits for factories during the last year.

The new plant will give opportunity for a great increase in capacity and more than 1000 men will be given employment in the various departments of the new works.

The tract of land that has been acquired as a site for the plant is in Commercial avenue between 156th and 157th streets. Here will be erected at a cost of nearly \$300,000 a complete plant, consisting of five main buildings and other smaller structures. The main factory is to be a building 250 by 600 feet. Besides this are a wood working department 100 by 310 feet, a boiler shop 100 by 300 feet, a foundry 100 by 200 feet, kilns and construction room 100 by 200 feet, and an engine room 40 by 60 feet. A shipping and receiving platform 60 by 540 feet is shown in the plans which are already drawn. The tract is near the tracks of the Illinois Central, the Chicago & Grand Trunk, the Calumet Terminal and the Chicago Central branch of the Northwestern, from all of which side tracks will be built to the receiving and shipping platform.

T. W. Harvey, the founder of the town of Harvey, was seen in regard to the new plant. He was pleased with the prospect of the addition of the great establishment to the 13 already located at the town which bears his name.

"The company is a good one," he

said. The parts are made on the interchangeable plan to facilitate repairing. The scraper is made in sizes from 2 to 5 inches.

A new safety device, known as the audible electric block signal, is now on trial by the Reading Railroad. By the invention one of the rails is a continuous conductor of electricity by connecting the rails electrically at the joints, and the other rail is divided into sections or blocks and provided with electrical connections which overlap from one block to another. Midway of the blocks, and also at the opposite ends of the blocks, are placed electric contact pieces, each formed of two plates insulated from each other and raised 6 inches from the ties. These plates lie in the path of two arms, or "feelers," carried by the locomotive and reaching downward toward the roadbed. Upon the locomotive is placed a battery and a gong or alarm mechanism. The arrangement of the circuits is such that when a train proceeds in one direction the "feeler" strikes a set of contacts controlling the circuit arranged for trains passing in that direction. When the train proceeds in the opposite direction the "feeler" strikes the opposite contact plate, securing similar results. Under certain conditions the system may also be used for the purpose of signaling from one moving train to another ahead on the same track.

The Mechanical Engineers.

The programme of the annual meeting of the American Society of Mechanical Engineers has been issued. The first session will take place on Monday evening, December 3. On Tuesday morning the principal business will be the reporting of committees on Methods of Test, Gauges for Thickness of Metal, Standard Flanges, &c. The papers of this session will be that by W. J. Keep on "Relative Tests of Cast Iron," and by George M. Sinclair entitled "Notes on Steel Forgings." On Tuesday evening, on Wednesday, Thursday and Friday mornings the following papers will be brought up:

Samuel and S. S. Webber: "Trials of a Vertical Triple Expansion Condensing Pumping Engine at the Trenton Water Works. Peabody Miller: "Tests on the Triple Expansion Engine at the Mass. Inst. Tech." [Second Paper.] F. W. Dean: "Trial of a Leavitt Pumping Engine;" "Trials of a Recent Compound Engine with a Cylinder Ratio of 7-1;" "Changing the Suction System of a Pumping Engine." Gaetano Lanza: "Tests of the Strength of Spruce Columns." C. V. Kerr: "On the Theory of the Moment of Inertia." Charles T. Porter: "Comparison of the Action of a Fixed Cut-off and Throttling Regulation, with That of the Automatic Variable Cut-off on Compound and Triple Expansion Engines;" "Description of a Cam for Actuating the Valves of High Speed Steam Engines;" "Description of an Improved Steam Separator and an Improved Steam Jacket;" "Description of an Improved Centrifugal Governor and Valve." Gaetano Lanza: "Stresses in the Rims and Rim Joints of Pulleys and Fly Wheels;" "The Application of Brakes to the Truck Wheels of a Locomotive." W. F. M. Goss: "An Experimental Study of the Effect of the Counterbalance in Locomotive Drive Wheels Upon the Pressure of Contact Between Wheel and Rail." C. J. Field: "Present and Prospective Development of Electric Tramways." Thomas D. West: "Relative and Special Tests of Cast Iron." M. P. Wood: "Rustless Coatings for Iron and Steel." George W. Bissell: "The Effect of Clearance on Economy of a Small Steam Engine." D. S. Jacobus: "Results of Experiments to Test the Accuracy of Small Throttling Calorimeters." John H. Bar: "Experiments on a System of Governing by Compression." Joseph C. Platt: "Straightening a Leaning Chimney 100 Feet High." A. W. Robinson: "Drawing Office Appliances." L. S. Randolph: "Strength of Railway Car Axles." Geo. R. Henderson: "A Graphical Method of Designing Springs."

A somewhat novel feature of the reception at Sherry's on Wednesday evening is that it will be introduced by the reading of the annual address by the president.

The S. Obermayer Company of Cincinnati, in a recent circular, call attention to their Ticeoleum pattern dressing, which they recommend for dressing iron, brass, composition, metal and wood patterns.

It is announced that an effort is being made by a syndicate in Denver, Col., toward establishing a common sales agency for the silver produced by the leading silver lead smelting interests of this country and Mexico.

The Iron Ores of the Mediterranean Seaboard.—IV.*

BY A. P. WILSON, ASSOC. M. INST. C. E.,
F. G. S.

Province of Malaga.

Marbella.—These well-known iron ore mines are situated about 5½ km. from the coast, near the village of Marbella, some 50 km. southwest of Malaga. The mines are connected with the coast by a private railway of 1 m. gauge worked by locomotive power, which terminates in a pier 1300 feet long, alongside which steamers with a draft not exceeding 21 feet can be moored. The cost of carriage from the mines to the coast, including the loading of the mineral into steamers, amounts to 1 shilling per ton. The ore is entirely magnetite, and is found in one deposit with a width of from 10 to 40 m., considerably faulted in its course. The workings are altogether underground, the Cumberland method of working being adopted, and the greatest depth yet attained is 180 feet from the surface. The output of ore varies from 70,000 to 80,000 tons per annum, and the most of it is sent to the United States. The estimated cost of winning the ore and placing it in trucks ready for carriage to the coast is probably about 5 shillings per ton, exclusive of royalty, and the present selling price is 10 shillings and 6 pence per ton, f.o.b. Marbella.

An analysis of the ore dried at 212° F. gives:

	Per cent.
Peroxide of iron.....	57.857
Protoxide of iron.....	28.585
Protoxide of manganese.....	trace
Alumina.....	0.336
Lime.....	0.504
Magnesia.....	5.290
Silica.....	8.650
Sulphur.....	0.070
Phosphoric acid.....	0.018
Combined water.....	0.690
Total.....	100.02

Iron in the dry.....	61.40
Iron in the raw.....	61.26
Moisture.....	0.26

Estepona.—At Estepona, some 30 km. southwest of Marbella, there are a number of iron ore deposits, from which a few cargoes have been shipped, and although none of the mines are being worked at present, there are rumors of some of them being shortly reopened. The mineral here is magnetite of good quality, as will be seen by the following analysis:

	Per cent.
Peroxide of iron.....	56.78
Protoxide of iron.....	25.08
Protoxide of manganese.....	0.40
Carbonate of lime.....	4.00
Sulphate of lime.....	0.06
Phosphate of lime.....	0.05
Carbonate of manganese.....	2.52
Magnesia.....	5.99
Alumina.....	0.70
Silica.....	3.55
Water.....	0.50
Alkali.....	0.29
Total.....	99.92

Iron.....	58.66
Sulphur.....	0.014
Phosphorus.....	0.01

Robledal.—There is a group of iron ore mines on the Sierra del Robledal, distant from Marbella about 22 km. in a northwest direction. Situated as these mines are on the northern slopes of the Sierra, which attains a height of 4000 to 6000 feet above

the sea level, they are somewhat inaccessible, and until a railway or cableway to the coast has been provided it will be impossible to work them. As at Marbella, the ore is entirely magnetite, of good quality, and remarkably free from impurities. From analyses of samples taken from different mines of the group, metallic iron varies from 61 to 66 per cent.; silica, from 0.30 to 4½ per cent.; sulphur, from traces to 0.04 per cent.; phosphorus, nil to traces. The mineral occurs between serpentine and limestone. The area of the mining concessions of this group is more than 300 hectares.

San Mathias.—About 10 km. northwest of Marbella there is another group of mines, known as the San Mathias mines, in the valley of the Rio Verde, a stream which debouches in the Mediterranean a few kilometers west of Marbella. Though less inaccessible than the Robledal mines, this group is still unconnected with the coast. The ore here is also magnetite, but the quality is not so good as at Robledal. An average analysis gave:

	Per cent.
Metallic iron.....	57.98
Alumina.....	2.94
Silica.....	9.02
Phosphoric acid.....	nil
Sulphur.....	0.04

The area of the mining concessions of the group is about 200 hectares.

Province of Sevilla.

At Pedroso and Guadalcanal on the Sevilla-Mérida Railway, there are large deposits of iron ore. The mines at the former place are situated about ten English miles from the nearest station on the Sevilla-Mérida Railway line, from which station to the port of Sevilla is about 53 English miles. The *Revista Minera* states that a railway is to be constructed from the mines to the Sevilla-Mérida Railway, and that arrangements have been made with the railway company to carry the ore to Sevilla for 4 pesetas per ton. The royalty is stated to be 7½ pence per ton on all ore extracted. The ore is said to exist in enormous quantities, to be very pure and to yield from 55 to 65 per cent. of metallic iron. The same authority says that for the working of another group of mines, situated only about 2 miles from the Pedroso station and 43 miles from the port of Sevilla, an English company is being formed privately under the title of the Iberian Iron Ore Company. Analyses made in England show a high quality of ore with 57 to 67 per cent. of metallic iron. It is stated that for a long time to come the ore can be got out by simple quarrying and that the cost of transport by rail to the port of Sevilla is very small considering the distance. Guadalcanal is still further away from Sevilla, being distant about 110 km. from that port.

The ores from all these places will have to be shipped at Sevilla, which is not a good shipping port, for only steamers of light draft can lie alongside the wharf, at which there is only limited accommodation.

These mines, especially in the case of Guadalcanal, will be seriously handicapped by such high railway freights, which are more than twice as much as is paid by any other iron ore company in the South of Spain. Should, however, the ore average 60 per cent. of metallic iron, as it is stated to do, and the quality be otherwise good, there is no reason why such mines should not be worked at a profit. The following are stated to be average analyses of the iron ore of Guadalcanal:

	No. 1. Per cent.	No. 2. Per cent.
Silica.....	5.55	0.40
Lime.....	.....	0.60
Sulphur.....	.....	0.02
Phosphorus.....	trace	0.04
Peroxide of iron.....	73.80	96.57
Peroxide of manganese.....	1.82	.....
Moisture.....	8.75	1.52
Totals.....	94.72	99.114
Metallic iron.....	54.80	67.7
Manganese.....	1.27	.....

Province of Huelva.

Although the province of Huelva does not figure at present in the list of exporters of iron ore, yet there are large deposits of this mineral, which, however, is not of a very high class. At the Rio Tinto mines the oxidized capping of the pyrites lodes which has been removed in the process of working by open cast has been stacked and there are now enormous quantities of this mineral available, exceeding 2,000,000 tons. The impurities of the ore, however, notwithstanding its high percentage of iron, are much against it, as the subjoined analysis of a sample illustrative of the whole lot will show, the arsenic present especially being a formidable obstacle. This ore could, however, doubtless be put on board at Huelva at a cheap rate, on account of the excellent facilities the Rio Tinto Company have for carrying and loading, and it is possible that some works, especially on the Continent, would use large quantities for making cheap iron, while no doubt a time will come when for such ore there will be a large demand. The ore is hard and lumpy throughout, there being no smalls; it is of a lightish red color, and of a porous character.

There are also deposits of iron ore at Fregenal, on the Huelvo-Zafra Railway, but situated as they are, more than 100 km. from the coast, the question of freight is a serious one, and they are not at present being worked.

Analysis of the Rio Tinto Iron Ore.

	Per cent.
Peroxide of iron.....	77.27
Protoxide of iron.....	0.50
Sulphide of iron.....	0.98
Sulphuric acid.....	1.87
Silica.....	6.72
Alumina.....	1.89
Lime.....	0.45
Magnesia.....	trace
Phosphoric acid.....	0.064
Arsenious acid.....	1.24
Lead oxide.....	1.59
Copper oxide.....	0.07
Antimony oxide.....	0.13
Combined water.....	6.90
Moisture.....	0.45

Total.....	99.92
Equal to iron.....	54.93
Equal to sulphur.....	0.52
Equal to phosphorus.....	0.028
Equal to arsenic.....	0.90

It will be seen from the foregoing observations that an almost continuous series of deposits of iron ore extend along the southeastern coast of Spain, commencing with the Porman deposits at Cabo de Palos, and continuing at no great distance from the coast through the provinces of Murcia, Almeria and Malaga, finally trending northwest to the further inland districts of the province of Sevilla. With improved facilities for transport, many, if not all, of these might be properly worked.

Algeria.

Passing now to the southern shores of the Mediterranean, large quantities of iron ore have been worked in Algeria, and for many years have been shipped to America and to Great Britain. There are innumerable known deposits, some of very considerable extent; and while the present output is about 150,000 tons

*Read at the Brussels meeting of the Iron and Steel Institute. See *The Iron Age*, October 25, page 718; November 1, page 754; November 15, page 853.

per annum, there is no doubt that it could be very largely increased.

The mines belong principally to the Mokta-el-Hadid Company, a French association which began work early in the seventies. There are two principal groups of mines, one at Mokta, near the port of Bona, and the other at Tafna, whose shipping port is Beni-Saf, the latter producing at the present time nearly the whole of the exported ore. The Mokta deposits are situated in the province of Constantine, on the southern slope of the range of mountains which skirts the coasts, and are connected with Bona by a railway 35 km. in length. The ore bodies, which consist of magnetite and hematite, containing small quantities of manganese, occur between micaceous schists and crystalline limestone, sometimes entirely replacing the latter and at other times only partially doing so. The deposit is nearly 2 km. in length, and presents a series of lenticular masses, measuring up to 40 m. in width, connected by narrower belts. The larger of these lenticular masses have been worked by open cast and are now almost worked out, and latterly the exploitation of the mine has been principally carried on by underground workings. About 5,000,000 tons have been worked since the year 1874, and it is calculated that there still remains a like quantity to be got. The cost price at Bona may be taken at about 6 francs per ton, and the selling price at about 8 francs. A large proportion of the output has been shipped to America.

The Tafna or Beni-Saf mines are situated in the province of Oran, near the mouth of the river Tafna. The deposits here, as at Mokta, occur in lenticular masses connected together by more or less narrow strips, but in the case of Tafna these masses are much larger, measuring up to 100 m. in width by 800 m. in length. The ore is a hematite of a dark red or purple color; it consists almost entirely of very small ore, being in fact almost powdery. The following is an average analysis of the ore shipped from these mines:

	Per cent.
Peroxide of iron.....	82.20
Protoxide of manganese.....	2.39
Silica.....	3.26
Lime.....	5.82
Sulphur.....	0.03
Phosphoric acid.....	0.04
Alumina.....	1.57
Water undetermined.....	3.85
Total.....	100.00

Moisture..... 7.77
Metallic iron in the dry..... 58.23
Metallic iron in the raw..... 54.01

The deposit is worked open cast in the large lenticular masses and the output is about 150,000 to 200,000 tons per annum. It is estimated that there are still 4,000,000 tons of ore available. The selling price at Beni-Saf is about 9 francs per ton.

Numerous other deposits are well known and have been partially developed in Algeria, but are not being worked, for the most part owing to the want of communication with the coast. One such is a prolongation of the Beni-Saf deposit which has been explored at Camerata, while another to the southwest of Beni-Saf has been thoroughly proved and is only waiting for means of transport; the ore from this latter mine is stated to run 50.82 iron, 8.14 manganese, 3.15 silica, 0.02 phosphorus.

Tunis.

Several concessions containing iron ore of excellent quality are in the hands

of the same company who are working the Tafna and Mokta mines in Algeria. They are not being worked at present, but will undoubtedly be commenced when the time is favorable. A railway of some 40 km. to the coast will be necessary.

Island of Elba.

This iron producing island of the Mediterranean possesses but little interest to British manufacturers, inasmuch as the Italian Government seriously discourage the export trade, in view of the fact that the deposits in the island, which have been worked from time immemorial, are within measurable distance of exhaustion. In the year 1885 the quantity of ore which remained available was estimated at 8,000,000 tons of all classes. Thereupon the Italian Government, who are the owners, limited the production to a maximum of 200,000 tons a year. In 1889 the production was only 100,000 tons. In 1892 the mines were leased under stringent conditions, one of which was that the output was not to exceed 180,000 tons per annum, nor to be less than 90,000 tons, of which one-third must be small washed ore, while Italian consumers were to receive much more favorable terms than foreign buyers. It is not to be expected, therefore, that much ore will find its way to England, and certainly not an increasing quantity.

The ore bodies, which occur in beds of limestone lying in mica schists, are found along the whole of the east coast of the island. The principal mines are Rio Albano, Vigueria, Calamita and Rio. The ores are principally specular iron ore and hematites, magnetite being scarce. The production consists principally of two classes of ore, one called Andante, which is a massive, lumpy ore, and the other is the washed product of the old waste heaps and is a small ore called Levato. The iron contents range from 58 to 62 per cent. The cost of getting is about 5 francs for the andante and 2 francs for the washed ore, including carriage to the coast, and the selling price is about 14 francs per ton at the coast. The ore sometimes occurs quite superficially, as at Rio Albano, where the bed reaches 50 m. in thickness, with an average of 10 m.; at other times it is covered by limestone and in places by schist. All the deposits are situated close to the sea coast. Evidence of the ancient workings is shown by the old waste heaps (called "gettate"), which are of enormous extent. Rio Albano is the only mine where these do not exist. The following is an average analysis of Elba "Andante" iron ore from Rio Albano:

	Per cent.
Peroxide of iron.....	89.06
Protoxide of iron.....	7.14
Oxide of manganese.....	0.23
Silica.....	1.71
Alumina.....	0.11
Lime and magnesia.....	traces
Phosphoric acid.....	nil
Arsenic.....	traces
Sulphuric acid.....	0.02
Combined water.....	1.13
Moisture.....	0.32
Total.....	99.72

Metallic iron..... 67.89

Other Islands.

Iron ore has been exported also from the little island of S. Pietro to the south of Sardinia, but not in great quantities. From Laurium in Greece, and from the islands of Milo and Euboea, iron ore is also exported; but for the most part these are manganese rather than iron ores.

From Seriphos, one of the Cyclades, however, good iron ore is obtained. The mines there belong to the Société Française de Seriphos et Spiliazeza, and are worked on the open cast system. The minerals consist principally of oligistic or specular iron with 47 to 55 per cent. of metal, and magnetite with 65 per cent. of iron; they carry also from 2 per cent. to 2½ per cent. of manganese. More than 60,000 tons are exported annually. The selling price ranges between 4 shillings and 6 pence and 5 shillings per ton, f.o.b., and as the greater part of the ore consist of lumps, it is much favored by Siemens steel makers in this country. Freight from Seriphos and other islands of the Grecian Archipelago to England fluctuate to a considerable extent, and are not nearly so regular and reliable as are those from the South of Spain. The variations are occasioned by the state of the Black Sea market, and advantage is taken of every opportunity when the ore can be shipped cheaply to England. The average rate for the last few years has been about 8 shillings per ton. The following is an analysis of red Seriphos ore:

	Dried at 212° F. Per cent.	As received. Per cent.
Peroxide of iron.....	67.71	65.56
Peroxide of manganese.....	3.10	3.00
Alumina.....	2.74	2.65
Lime.....	8.96	8.67
Magnesia.....	0.61	0.59
Silica.....	3.10	3.00
Sulphur.....	0.03	0.03
Phosphoric acid.....	0.08	0.08
Arsenic.....	trace	trace
Oxide of copper.....	0.02	0.02
Oxide of lead.....	0.20	0.19
Combined water.....	5.40	5.23
Carbonic anhydride.....	8.00	7.75
Moisture.....	.....	3.18
Totals.....	99.95	99.95

Metallic iron..... 47.40 45.89

It will be seen, therefore, that abundant supplies of good iron ore exist at many places along the seaboard of the Mediterranean, many of the deposits being as yet undeveloped, and in view of this no anxiety need be felt for the requirements of the immediate future even though the exhaustion of the Bilbao district should be accomplished at an earlier date than some authorities imagine.

The south of Spain and the coasts of Algeria present the most favorable conditions for exploitation, since the large export trade to the coal depots of the Mediterranean provide ample freightage for the return cargo; while steamers carrying fruit or esparto grass can also be had to carry iron ore as ballast at low rates.

Plans are on foot for the construction of two electric railroads from Baltimore to Washington and Gettysburg respectively. The company who propose to build the Baltimore-Washington road are advertising for bids for constructing 16 miles of double track road from Washington to Laurel. The specifications provide that the road shall be laid with 80 pound steel rails and shall be so ballasted and constructed as to support electric trains attaining a speed of 60 miles an hour. Three steel bridges are also included in the specifications. It is proposed to complete the entire line within a year. The distance from Baltimore to Gettysburg on the line which the electric railroad will take is 50 miles. The Elkins-Widener Street Railway Syndicate are said to be the moving spirits in both these projects, and the lines will connect with their suburban lines in Baltimore.

Canadian Notes.

At the time of last writing the matter of uppermost interest was the declared intention of the Massey Harris Company to transfer to the southern side of the border the chief part of their great agricultural implement works. That step, they claimed, was forced upon them by the limitations which the recently revised tariff threw around their industry. It had cut down their protection by three sevenths, and it made little or no compensatory change in the duty on their material. They would have had to bow to this if their business was merely domestic, but as they sought to give it a strong export development, they could do that part of it with much more satisfaction from works in the United States. It seemed as if no concession would be made by the Government, which had shown so much new independence in lopping off protection, and the departure of the company appeared inevitable. But the loss of an industry that is one of the most conspicuous results of its trade policy is evidently considered by the Government too great a sacrifice to make to its farmers' tariff. By an order in council passed a few days ago it virtually places on the free list all material that is brought into the country to be manufactured into articles for exportation. This ought to change the purpose of the Massey-Harris Company to betake themselves to another country. Hitherto a drawback of 90 per cent. of the duty was allowed on imported material that entered into exported articles, on condition, however, that such material could not be obtained in Canada. But under the new order the drawback is increased to 99 per cent., leaving the duty just 1 per cent., and the condition is dropped. That is, raw material, no matter of what character, pays a duty of 1 per cent. if its product is exported. This is copied from the United States tariff law. Its effect will be far reaching. Heretofore our trade policy has nursed industries to supply the domestic demand, but now the results of that policy have been brought up against its own wall, and the same has to be taken down on one side. Benefit to the agricultural implement industry was far from the sole object aimed at by the change. Other developments were calling for it. The Colonial Conference held in Ottawa last summer has undoubtedly given a new bent to Government policy. If we are to trade with the Australasian colonies we must be able to supply them with some articles that they do not produce for themselves. As matters stood before this departure we could not do that in any important degree, as the only things we produced on a basis that would allow of exportation were natural products. These Australia produced for herself. But Australia offers a capacious and varied demand for engines, machinery, tools, hardware, paper, cotton fabrics, &c., the material for which our manufacturers had formerly to pay a protection tribute on that prohibited exportation. A large development of our Australian trade is now looked for, and large it needs to be if it is to make profitable our contemplated outlay for a Pacific cable and a new line of fast steamships. Such a change in the tariff looks like the first step toward the Customs Union that the Imperialists have in their mind's eye. The next step is for the Australasian colonies to stiffen their duties against the manufactures of non-British countries and work into

the hands of their Canadian brethren. The effect of the change cannot fail to be stimulating to the demand for material from the United States. Pig iron, bar iron, steel and every metal thing that can be made into something else will be in stronger demand from there than it was before, for a vigorous exportation is to be undertaken by several of our manufacturers. If it keeps our large manufacturers from crossing the border, it sends more of their demand there. The increased importation of material will tell on the prices of domestic material, though the product of the latter must all be exported for it to get the benefit of the rebate. For example, the Canadian producer of pig iron will feel that he can afford to sell such of his iron as is exported in stoves at as low a price as the United States smelter, as a demand on account of such export trade is something new and is entirely over and above the home demand. He will reason that he can recoup himself on that portion of his iron which he sells for stoves to be used at home, as such trade is still protected. But in bidding on an export basis against his United States rival he is at the mercy of the stove maker, who is not bound to confine himself to the truth in his representations to the smelter as to what branch of his trade—the export or the domestic—he is going to use the iron for. The Government has a check on the stove maker in its import and export returns, but this check will prove of little service to domestic producers of pig iron, who are sharply competing to sell iron at a price less the amount of the duty. The tendency of the new rebate, therefore, will be to knock down home prices and greatly moderate the effects of the protective system. But it will often bring about complications.

Canadian furnaces continue to increase their output despite the growth of competition from the United States. This is because they accept the prices that such competition dictates. In the race low grade Scotch irons, once the staple supply, have fallen far behind. Even Summerlee is dropping out of demand, as it is fully \$4 a ton higher than our own brands of equivalent utility. The quality of Canadian iron is a matter on which opinions of foundrymen differ, some maintaining that No. 1 domestic Siemens, or Ferrons, is preferable to Summerlee; others that it is no better than Carnbroe or Dalmellington. Use, however, is the convincing test, and it is deciding by an increasing voice every day in favor of the home product. It is far cheaper than either of the classes of British grade it is compared with. The margin of profit is a narrow one now, though, no doubt, some of the enforced drop in prices has been counterbalanced by economies. The cost at the furnace mouth is, however, still very high—scarcely less than \$12. It cannot be laid down at Montreal much below the price now realized there—that is, \$17 to \$17.50. If they had not the bounty and the duty the manufacturers of pig iron would find it impossible to continue.

Five cars of pig iron were sold to a Montreal firm the other day by the representative of a United States house at a price in the vicinity of \$17.50.

Fierce cutting among the manufacturers of bar iron has been the rule since the beginning of October, and it looks as if the price was making its way to a \$1.50 basis, having got some time ago to \$1.60, and the spirit still being strong among competitors.

The price of cut nails has been under

very demoralizing influences this fall, values having fallen below even the low price to which the material has been brought. The war between manufacturers has made \$1.50 a possible price before long.

A lot of 100 tons of Summerlee iron has been offered at \$19.50 a ton to arrive in Montreal. This is a sharp drop, \$21 and \$21.50 being the rule awhile ago.

Fencing wire and hoops and bands have lately been offered at very low prices from the United States.

Cast iron pipe is coming in in large volume from the States at discounts ranging from 10 to 12 per cent. higher than those given here.

Clyde Shipbuilding.

For the first nine months of this year the output of new shipping on the Clyde amounts to 252,100 tons, a figure which has only been surpassed for the same period twice during the past decade—viz., in 1892, when the nine months' output reached 275,935 tons, and in 1890, when it was 256,333 tons. Notwithstanding the fact that operations have been considerably handicapped on account of the miners' strike, the output during September is comparatively large, being not less than 19,295 tons over the production of September of last year. Altogether 20 vessels, measuring 38,070 tons, were placed in the water, as against 16 vessels, aggregating 18,775 tons, in the corresponding month of last year. The vessels launched consisted of two war vessels and 14 steamers measuring 30,370 tons, and four sailing vessels of 7700 tons. Seventeen were for British owners, one for German, one Brazil, and one for San Domingo. Five of the new steamers measure over 5000 tons each, and include the "Strathgyle" of 7350 tons capacity, launched by Russell & Co., Greenock, for Burrell & Sons of Glasgow; the "Orestes" of 6400 tons capacity, launched by Scot & Co., Greenock, for the Ocean Steamship Company, Liverpool; the "Planet Venus," 5600 tons, by Hamilton & Co., Port Glasgow, for a Liverpool firm; and a vessel unnamed, of 7000 tons capacity, launched by A. & J. Inglis of Pointhouse. A number of important contracts have been placed during September, the new work secured representing nearly 30,000 tons, as compared with 24,000 tons last September. The orders include four steamers of 4500 tons each for the Peninsular & Oriental Steam Navigation Company—three to be built by Caird & Co., Greenock, and one by Alexander Stephen & Sons, Linthouse.

Petroleum, as a fuel for war vessels, says a foreign service journal, will be introduced into the Russian navy, by a recent order of the Russian admiralty. The new armored cruisers "Rostislav" and "Rossia," now building at Nicolaieff and the Baltic Iron Works respectively, will be the first vessels to be fitted with petroleum furnaces, and the liquid fuel will be fully tested in these ships before other vessels are so fitted.

Under the new tariff law any dutiable article can be manufactured in bonded warehouses, instead of only the few allowed under the old tariff. The new regulations governing bonded manufacturing warehouses have just been issued by the Treasury Department.

Welding.

From a paper read at the recent convention of the National Railroad Master Blacksmiths' Association by S. Uren, foreman of blacksmith shop and rolling mill of the Southern Pacific Railway, we take the following:

The different methods of preparing iron to be welded are governed by the conditions and shape of the forging and appliances. Lap welding is the usual method adopted by smiths, and when practical in my opinion is the best. In many cases there is not enough care taken in preparing the parts to be welded. The scarfs should be as long as can be conveniently heated, never more than a 45° angle. The scarfed

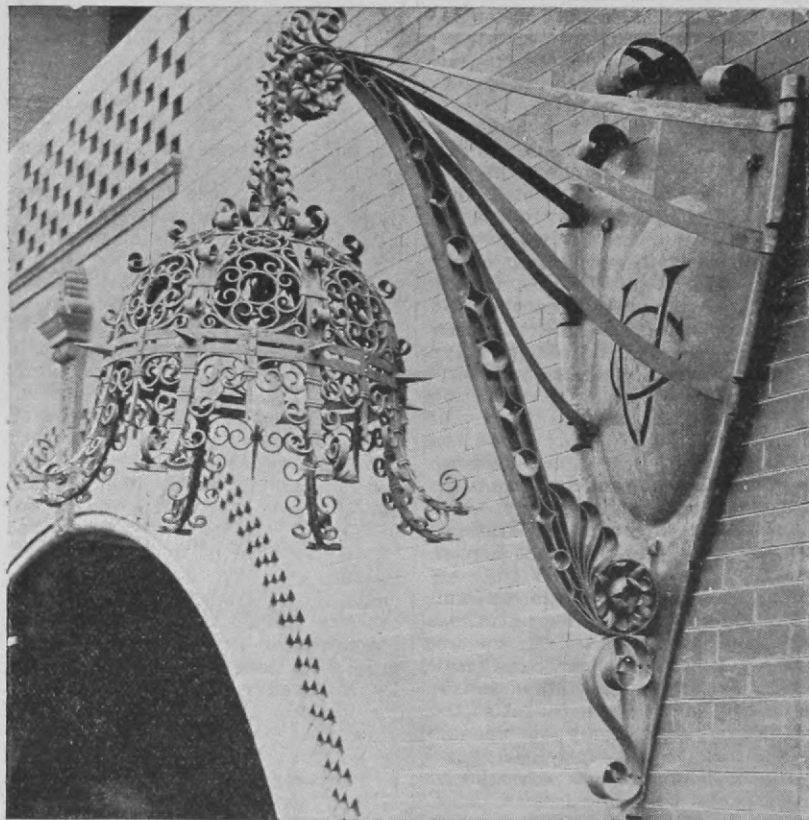
proper treatment of the iron back of the weld, as I consider this of vital importance. In many cases in testing welds by breaking transversely, I find good fibrous iron in the welded section and crystalline each side of the weld. The cause of this is improper treatment of the iron back of the weld or that it was not properly upset where it was brought to near a welding heat. The molecular structure of wrought iron becomes disintegrated to a certain extent when brought to a high heat; consequently if there is not sufficient metal back of the welded section to receive the necessary lamination to bring the disarranged molecules to their original position the strength of the bar is greatly impaired.

I have made a series of tests on this subject in the manufacture of car axles.

method if a good clean heat is secured and the above treatment carried out.

Butt welding is simply and easily prepared for the work by upsetting the ends, leaving the surfaces a little convex. This method of welding requires great care in bringing the two pieces to be welded to precisely the same heat and keeping the surfaces perfectly clean. When brought to the proper heat the parts should be thoroughly forced together with heavy sledges or battering ram. For general purposes I do not approve of this method; for small welding it is impracticable; in all cases, in my opinion, the V or lap weld is preferable. In every case the broken section of this class of welds shows a crystalline structure.

The method of welding by laying in V or angle pieces is adopted for heavy rings or frame work of any description. In frame work the different parts to be welded should be firmly bolted together so as to retain the members in their proper position while the welding in of the angle piece is performed. This welding requires good judgment on the part of the smith. The two ends to be welded should form an angle of about 55° when bolted together; the angle piece to be welded in the cavity should be about 5° degrees less angle than the opening of the two ends of the bar, for the purpose of insuring a perfect weld in the bottom of the recess, and must contain cubic inches sufficient to properly fill the opening. Care should be taken that the fibers of the piece to be welded in are in the same direction as the bars to be welded. In the Southern Pacific shops we make special iron for this purpose from old horseshoes. The preliminary preparations being made, the parts to be welded are placed in the fire, the small angle piece usually in a separate fire. When brought to the proper heat the bar is placed on the anvil and the small angle piece forced into the cavity with heavy sledges, thoroughly welding the angle surfaces of the two ends of the bars; the same operation is performed on the opposite side of the bar, making a complete weld. In 1880 I adopted this method of welding on the legs of locomotive frames instead of the old method of jumping them on the main bar.



ELECTRIC HANGING LAMP.

surfaces should be slightly convex or high in the center, so that when the two pieces are laid together for welding the center will take its bearing first, as it is absolutely necessary that the center of the bar should be welded first. Prior to making the scarfs, upset the bar back as far as it will be exposed to intense heat, for the purpose of lamination over the whole length of the heated surface, as it is imperative that the iron that has been near a welding heat should be as perfectly hammered as the welded part. After the preparation of scarfing is complete, lay the two pieces carefully in a hollow fire and bring to the proper heat. Before laying together be sure no foreign element has adhered to the scarfed surface. In laying together the point of one scarf should just reach the heel of the other. The weight of the hammer used to weld the two pieces must be governed by the size of the bar, as the blow should be sufficient to affect the center of the metal. With this precaution a good weld will be secured.

I again call your attention to the

The usual method of making axles is to first rough the pile, then finish each half at separate heats.

"V" welding consists of a combination of butt and lap welding. The scarfs are formed by fitting the two pieces together at an angle of about 45°. In preparing the scarfs make the throat of the inside angle a little rounding and the point of the outside angle to correspond. The scarfed surfaces should be a little convex across the surfaces, as in the lap weld, for the purpose of insuring a perfect weld in the center of the bar. This method of welding is usually adopted where large pieces of iron are required to be welded. In all cases in this class of welding the throat should be welded first, by being driven together with a battering ram or heavy sledge hammer, applied at the end of the bar when brought to the proper heat, before being taken out of the fire if practicable. The piece is then placed on the anvil and the two laps welded. The same care must be taken back of the weld as explained in lap welding. A good weld can be produced by this

Electric Hanging Lamp.

We here illustrate an electric hanging lamp made for the Union Club of St. Louis by the Ludlow Saylor Wire Company of that City. This lamp is made of wrought iron and given the Bower-Barff finish, which renders it absolutely rust proof. The design of the lamp was furnished by the architect, T. C. Link.

In answer to the report that the Chartiers Iron & Steel Company, Limited, of Pittsburgh, manufacturers of fine sheet iron and sheet steel, and whose works are located at Carnegie, Allegheny County, Pa., would erect a tin plate plant in the near future, we are officially advised that the statement is untrue. It is suggested that the report was gotten up for the purpose of booming some of the street car lines which are now under way in the direction of Carnegie.

The directors of the National Lead Company have declared a dividend on the preferred stock of 1½ per cent., and 1 per cent. on the common stock.

Garland on Sliding Scales.

One of the speakers at the recent Congress on Industrial Conciliation and Arbitration, held at Chicago on November 13 and 14, was M. M. Garland, president of the Amalgamated Association of Iron and Steel Workers. He spoke on the subject of "Sliding Scales and Kindred Methods." Coming from such a source his remarks are of interest, although they do not touch the most serious drawback to sliding scales which has developed in the iron trade during the past few years, and that is that prices have fallen so rapidly that they have been far below the minimum of nearly all the sliding scales now governing wages. Mr. Garland said in part:

Sliding scales, as they have been termed, are in our estimation a step in advance of any system now in general use. The wages of the iron and steel worker have been based on and determined by this plan for twenty-eight years, and in fact the iron and steel workers claim to be the pioneers of the sliding scale system. As a test to its efficiency, when fair employers are concerned, we recall to mind some of the most successful firms in the iron and steel trade, who have been treating with labor in this way during all that period of time, and who participated in drawing up the conditions of the first sliding scale. Since the time of the first adoption by the iron and steel workers new features have been introduced from time to time, just as it was necessary to perfect the system to new conditions arising.

Under this system of a sliding scale a rate of wage is agreed upon for each position, to be covered by the scale, and then a selling price for the material is selected as being a fair minimum price while that particular rate of wages is paid; a percentage of advance in the selling price of material is then listed as requiring a slight percentage of advance in the wages of the men in the several positions. The ratios of advance in wages are thus listed with the advance in material until the probable highest figure the material will sell at has been reached. A corresponding reduction in wages is agreed to as the material recedes in price. But a minimum price is agreed upon as representing a stopping point in the decline of wages, and although the employer is free to sell his material below the minimum, he is not permitted a reduction in wage below.

Certainly, there can be no plan proposed to the average mind that bears a more equitable phase than that when the price of material or goods goes up the laborer's price should advance as well. One of the advantages, and perhaps one of the chief advantages, of the sliding scale system is the bringing together of employer and employee in conference and discussion of trade, duties, conditions, prospects and ability to pay a fair wage. The intricacies and details of the sliding scale require full investigation into all these points and many others.

After all, it is the getting together of employer and employees with fair intention that cultivates reason on both sides. We are loath to believe the oft-repeated assertion of capital and labor being at war, but the greater strangers they continue the more they are convinced that the other is antagonistic to them. Hands cannot be clasped that are not extended, and companions are not made of people who never meet. The sliding-scale system has found

favor among numerous trades and has proved a very interesting feature in unionism. Perhaps the chief gain of basing wages on the market value of the article produced consists in its acting as a strong incentive to workmen to keep close watch on the values of their products and to take account of all cost entering into their production.

Last week the coal miners in the Pittsburgh district took important action relating to the company store question. They voted to accept the proposition made last summer by M. H. Taylor, of the Pittsburg and Youghiogeny Coal Company, to abolish the stores at the mines of that concern. The proposition was that the stores should be turned over to the miners, who in return are to allow the company a differential of $2\frac{1}{2}$ cents per ton on all coal mined. Francis L. Robbins, also a large coal operator, has agreed to turn over his stores to the miners in his employ on terms similar to the above. It is expected that the acceptance of these propositions will have an effect on the adjustment of the mining rate at the mines of the New York & Cleveland Gas Coal Company, where a differential of 5 cents per ton has been in force, on the ground that the company has no stores and pays in cash. Hereafter the miners will likely insist upon a differential of $2\frac{1}{2}$ cents per ton from the New York & Cleveland Company, instead of 5 cents, which has been allowed for about 11 years.

At a conference held between members of the Mahoning and Shenango Valley manufacturers and representatives of the Finishers' Union, held in Youngstown, Ohio, early in the present month, some changes in the wage scale were made. These changes are to conform with changes made in the Amalgamated Association scale in June last, and are on hoops, $\frac{3}{4}$ inch and wider, No. 20 and heavier, 10 per cent. off rollers' and 5 per cent. off heaters' wages. Also on mills making a specialty of pipe or skelp iron 10 per cent. less than regular prices. These changes were readily agreed to by both sides, and without transacting any further business the conference adjourned and will meet again some time before January 1, 1895.

Preliminary Tests on the Strength of Copper.*

BY A. MARTENS.

Owing to the want of sufficient literature and on account of the absence of official and authentic data on the properties of copper, engineering societies and Government inspectors had frequently urged the desirability of thorough tests and investigations on the strength of copper. In response to these appeals the Minister of Commerce and Industry ordered the Royal Prussian Testing Department to make such an investigation. On account of the importance which such investigation would assume by being a guide for every day practice it was deemed advisable to make a series of preliminary tests in order to determine the nature and extent as well as the requirements necessary for the final and conclusive tests. In the following we present, therefore, only the conclusions reached by these

preliminary tests, which, therefore, are liable to correction and modification by the results of the final tests. However, certain facts have developed during these preliminary tests which leave hardly any doubt as to certain characteristics of the metal under investigation.

The testing of Mansfeld, Lake, Arizona, English best selected Chile, Wallaroo, Rio Tinto-Tharsis copper,

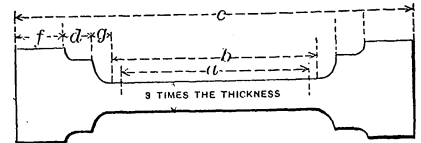


Fig. 1.—Form of Test Piece.

was taken into consideration, being the classes of copper most commonly found in the market.

The plan for the preliminary investigation involved the following questions:

1. How will the results be influenced by—
 - a. The form of test piece.
 - b. The method of preparation of the test piece.
 - c. The speed at which tests are to be made.
 - d. Testing by increments or by a steadily increasing load.
2. How will the condition of the material influence the test?
 - a. Can the metal be brought to a normal condition for testing by annealing?
 - b. What shall be the best method of annealing?
 - c. What influence has repeated annealing on the metal?

To settle these questions not only tensile but bending and crushing tests were made.

On account of the high price of copper it was also desirable to know the

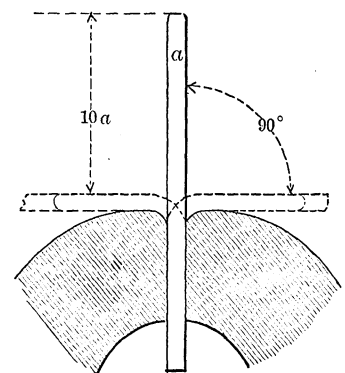


Fig. 2.—Bending Test.

results obtained with smaller than normal or standard test pieces and how far comparable these would be with results obtained from standard test pieces.

Sheet copper 12 mm. thick and reduced to 10 mm. was thought the most suitable shape for the material to be tested.

The following form of test piece Fig. 1 was considered standard:

- a. 20 times the thickness.
- b. 21 times the thickness.
- c. 41 times the thickness.
- d. 3 times the thickness.
- e. 5 times the thickness.
- f. 2 times the thickness.

* Extract from the "Mittheilungen" zweites und drittes Heft. 1894.

To ascertain the influence of proportion of test section the following different sections were used:

Proportions.	Dimensions. Millimeters.	Cross section. Millimeters.	Remarks.
3 x 1 x 20	30 x 10 x 200	300	Present stand- ard.
3 x 1 x 20	21 x 7 x 140	147	New standard.
1 x 1 x 20	7 x 7 x 140	49	.....
5 x 1 x 20	35 x 7 x 140	245	.....
10 x 1 x 20	70 x 7 x 140	490	.....

Bending tests, Fig. 2. were made with test pieces 14 times the thickness, and 1, 3 and 5 times as wide as thick, to be bent 90° right and left until fracture took place.

The main tests, to be made later on, will have to decide the following questions in addition to the questions to be solved in the preliminary tests as already stated:

- 3. What is the influence of chemical composition on the strength of copper?
- 4. What relation is there between the chemical composition and mechanical treatment?
- 5. What is the permissible strain on copper when in its normal condition and when worked?
- 6. What strength is obtainable by—
 - a. Riveting.
 - b. Soldering.
 - c. Soldering and riveting.
- 7. What is the influence of heat on the strength of copper?

The test plates were rolled from an ingot 900 mm. long, 950 mm. wide and 140 mm. thick. Test pieces were cut lengthwise of the plates.

One plate 12 mm. thick, after rolling was annealed and quenched in water.

One plate 12 mm. thick was annealed, quenched in water, annealed again and let cool slowly.

One plate was annealed, quenched in water, annealed again, cooled slowly and then hammered to 12 mm. thick.

One plate 9 mm. thick was annealed and quenched in water.

One plate 9 mm. thick, annealed.

One plate 9 mm. thick, hammered.

Since no authentic data was at hand at what degree of heat the strength of copper became impaired it was deemed best to settle this question by making some heat tests with hard drawn copper wire of 7.1 mm. thickness.

These test pieces, 300 mm. long, were heated for two minutes each.

Up to 180° F. the specimens were heated in steam; up to 360° in paraffine and for temperatures of 500° and more a metal bath was used (lead, tin and a little bismuth). The lead did not adhere to the copper until a temperature of 800° F. was reached, when the surface of the copper was attacked by the metal in spots. Some specimens of the copper wire were subjected to a temperature of 500° for 1, 2, 4 and 10 minutes, and at 630° for 1, 4 and 10 minutes, and then quenched in water of the temperature of the room.

This was done to ascertain the influence of prolonged heating on the strength of copper.

Other specimen were heated to 500° 32 times and quenched every time; also heated to 650° 2, 4 and 8 times for a half minute each time and quenched every time.

The results of these tests were surprising and showed that a noticeable change takes place in the behavior of copper at 540° F., while this change becomes very decided at 585° and 630° F.

At 720° F. the copper has become so soft already that the raising of the temperature to 1000° F. seems to make but little difference.

either repeated heating or long continued heating to 630° F. are sufficient to completely soften hard drawn wire. These foregoing results raise the—

Table 1.—Stretch of Hard Drawn Copper Wire When Heated Two Minutes, in 1-10,000 mm., Measured in 4 Inches.

Load applied. Pounds per square inch.	Heat applied. Degrees Fahrenheit.									
	0	180	360	540	585	630	720	810	900	990
3,550	143	144	141	136	137	144	155	160	160	163
7,250	531	538	533	509	296	334	515	551	584	700
14,360	741	734	719	688	669	724	3,050	.....	.....	.....
21,610	1,167	1,147	1,112	1,153	1,142	1,226	.....	.....	.....	.....
28,720	1,600	1,584	1,521	1,450	1,435	1,526	.....	.....	.....	.....
35,970	2,070	2,050	1,981	1,873	1,856	1,998	.....	.....	.....	.....
43,080	2,590	2,551	2,455	2,355	2,337	2,588	.....	.....	.....	.....
50,330	3,223	3,150	3,089	2,947	2,981	3,624	.....	.....	.....	.....

Table 2.—Stretch of Hard Drawn Copper Wire When Heated, in 1-10,000 mm., Measured in 4 Inches.

Load applied. Pounds per square inch.	Heat applied. Degrees Fahrenheit.													
	540						630			630 for 0.5 min.			945	
	0.5 min.	1 min.	2 min.	4 min.	10 min.	32 times.	1 min.	4 min.	10 min.	2 times.	4 times.	8 times.	5 min.	.....
3,550	123	132	130	141	122	140	151	163	110	128	132	141	170	.....
7,250	319	315	309	325	302	333	353	396	375	323	312	338	687	.....
14,360	695	678	689	695	680	719	758	865	1,302	720	708	733	3,200	.....
21,610	1,082	1,051	1,060	1,072	1,062	1,098	1,160	1,398	.....	1,134	1,109	1,203	.....	.....
28,720	1,461	1,429	1,450	1,470	1,454	1,495	1,587	2,033	.....	1,568	1,632	1,699	.....	.....
35,970	1,875	1,851	1,873	1,873	1,885	1,911	2,059	3,095	.....	2,030	2,005	2,323	.....	.....
43,080	2,331	2,315	2,350	2,347	2,355	2,377	2,588	.....	.....	2,550	2,555	3,658	.....	.....
50,330	2,864	2,880	2,775	2,921	3,008	2,968	3,446	.....	.....	3,312	3,500	.....	.....	.....

Table 3.—Strength of Hard Drawn Copper Wire When Heated.

Heat applied. De- grees Fahren- heit.	0	180	360	540	585	630	675	720	810	900	990
Limit of stretch (yield point). Pounds per square inch ...	52,470	53,600	53,180	50,760	48,950	44,080	28,440	8,250	6,540	5,970	5,970
Maximum load. Pounds per square inch....	56,590	57,440	57,300	55,170	53,890	49,770	45,960	35,830	35,830	34,980	34,980

Table 4.—Strength of Hard Drawn Copper Wire When Heated.

Duration of heat applied	540						630			630		
	0.5 min.	1 min.	2 min.	4 min.	10 min.	32 times.	1 min.	4 min.	10 min.	2 times.	4 times.	8 times.
Limit of stretch (Yield point). Pounds per square inch.	54,740	52,610	51,330	52,000	50,200	51,400	47,770	30,850	10,800	48,490	46,640	37,960
Maximum load. Pounds per square inch.	58,300	57,300	52,180	58,300	56,456	55,740	55,740	44,790	38,670	56,590	52,890	47,630

As a first result of these tests we become aware that there is no proportionality between stress and stretch. In order to ascertain the elastic action of copper (elasticity) it was of importance to know at what stress or load measurable permanent set would take place. Up to 540° F. the results are quite uniform. At 720° F. a rapid decrease is noticeable, and the resulting diagrams show that even in hard drawn copper wire the permanent set lies very low indeed. Heating of a hard drawn copper wire for two minutes to a temperature of 450° F. is sufficient to produce change in the physical qualities of copper, while softening begins between 540° and 700° F. Beyond this there is but a slight increase in softness.

The results of repeated heating and quenching established the fact that

for the daily practice important—ques-
tion: How high can hard drawn wire
be heated without producing a gradual
lowering of strength?

For a complete settlement of this question it would be desirable to make very elaborate tests. However, as a result of the tests thus far made we are justified in assuming that the point of beginning change lies at about 360° F., by which we may conclude that cooking utensils made of hard copper may have their qualities changed through repeated heating.

Returning from these tests of hard drawn wire to the tests of copper plates, efforts were made to ascertain the limit of proportionality, or elastic limit; the point where permanent extension begins; or yield point; the maximum and breaking loads; the

elongation, and the effects of repeated strains on the strength of copper. As to the latter property, it was found that a repetition of strains increases the tensile strength to a higher than the previous result. This seems to be true, however, more with hard copper than with the softer kinds.

This increase of strength or stiffening becomes noticeable only after a load of 7000 pounds per square inch. There seems to be no proportion between load applied and elongation, no regularity of decrease in the percentage of stretch as hardness increases.

Permanent set begins at a very low load and as might be expected more so with soft than with hard copper; in fact there seems to be practically no limit of proportionality in soft copper. In hard copper this limit lies below 5 kg. As might be expected and in conformity with Bauschinger's fourth law,* the yield point is higher in hammered than in soft copper, while the total stretch after rupture, as measured in the test piece, is less. Hard drawing, hammering and rolling stretches the copper far beyond the original yield point, hence this higher limit of hard copper.

In order to eliminate possible errors it was thought essential to establish the influence of speed of testing. In other words, whether a higher speed increased the tensile strength and decreased the elongation sufficiently to make allowance for it in making these tests.†

It was found that: 1, The rate of flow has no perceptible influence on the maximum and the breaking load; 2, the influence in difference of speed on the total elongation and reduction of area is very small and decreases in proportion with the rate of speed; 3, the rate of flow (rate of speed) has a perceptible, but practically considered immaterial, influence on the yield point, which point, however, increases with the rate of speed.

As shown in Table 4, a difference in the rate of speed between 0.5 per cent. and 40 per cent. per minute produces only a difference of not more than 2 per cent. in the result with soft copper.

It was also found that differences in the form of test piece have but a slight influence on the final results, unless the elongation is measured in very short test sections. The so called after stretch—that is, the peculiarity of metals to continue to stretch after the load has ceased to act for the time being, but while the metal is still under strain—was found to take place in soft copper at as low a load as 2900 pounds per square inch of section. This after stretch decreases with the time, so that it is less the second minute and with a load of 10,000 pounds per square inch than the first minute with a smaller load. It is safe to assume, therefore, that the copper comes to rest under loads of 10,000 pounds per square inch. With hard hammered sheet copper the after stretch

becomes perceptible at loads of from 10,000 to 14,000 pounds per square inch.

The form of test piece seems to have no perceptible influence on the after stretch.

Cold hammering raises the yield point (beginning of permanent elongation) four times higher than that limit is in the metal when in its soft state. On the other hand, the maximum load is not raised much higher. The elongation is lowered considerably, contraction of area but little.

Annealing of hard hammered copper reduces it to its primary softness almost entirely.

Tests were made with soft copper punched cold. This raised the yield

point and decreased the maximum strength.

Reaming out of the punched holes has but little beneficial effect in removing or lessening the injury done by the punching; the maximum strength is but little raised.

Drilling the holes has no injurious effect on the quality.

For daily practical purposes it is of importance to know what deduction can be made from the results of the foregoing tests in regard to the permissible working load.

Though the tests were not exhaustive there is no doubt that the upper limits of the permissible working loads may vary according to the condition of the metal and the purposes it is to be applied to.

From the behavior of hard hammered copper it appears that the influence of continued or oft repeated heat becomes effective at about 450° F. The yield point, which has been raised by hard hammering is the first quality to be affected and lowered by heat.

The question whether we can make use of the raising of the yield point by hard hammering for constructive purposes must be solved by fatigue tests and chemical analyses of copper. It has been satisfactorily demonstrated that the form of test pieces is of influence. Sharp cutting tools should be used in preparing test pieces. Difference in rate of speed is of no practical value on the result. Likewise is the difference between testing with increments or steadily increasing loads not great enough to be taken seriously.

To produce a normal condition of copper, when it is to be tested and investigated, the metal should be annealed at about 900° F. and quenched in water of the temperature of the room.

Table 5.—Results of Test of Copper Plates 12 mm. Thick.

Average of five tests.

Dimensions of test section, in millimeters.	Speed tested, in minutes.	Maximum load, Pounds per square inch.	Breaking load, Pounds per square inch.	Yield point, Pounds per square inch.	Elongation, Per cent. in 8 inches.
As Received from the Works.					
10 x 30	4	32,700	.....	9,527	45
7 x 21	4.3	32,700	27,440	9,527	45
After Annealing.					
10 x 30	.....	32,420	.....	9,811	47
7 x 21	4.3	32,130	27,440	11,560	45
After Hammering.					
10 x 30	.....	33,700	.....	25,170	32
7 x 21	4.5	33,750	28,150	29,000	29

Table 6.—Results of Tests of Hammered Copper Plates.

Yield Point. Pounds per square inch.	Maximum load. Pounds per square inch.	Elongation per cent. in 8 inches.	Contraction of area. Per cent.	Condition of plates.
8,950	32,420	47	58	Results of tests of Original copper as received from the works. thickness 9 mm.
32,250 32,770 39,500	35,830 38,530 40,660	24 10 6	54 51 48	Reduced to.....7.5 mm. Reduced to.....6.5 mm. Reduced to.....5.5 mm.
8,250 6,250 9,000	22,320? 31,560 31,280	45 45 46	54 57 55	Reduced to.....7.5 mm. Reduced to.....6.5 mm. Reduced to.....5.5 mm. and annealed.
6,680 4,400 6,400	32,130 30,710 30,900	44 52 47	58 60 57	Reduced and annealed as before, then test pieces cut out. Prepared test pieces annealed again and quenched.

Table 7.—Results of Tests of Soft Copper Plates. Heated and Quenched.

Heated to Degrees F.	Yield point. Pounds per square inch.	Maximum load. Pounds per square inch.	Elongation. Per cent. in 8 inches.	Contraction of area. Per cent.	
	8,950	32,420	47	58	Plates as received from works.
540	9,100	44,030	49	61	
580	9,100	43,900	46	61	
630	7,400	30,850	48	64	
675	7,820	31,850	47	58	
720	8,530	32,270	49	63	
810	8,100	43,900	47	61	
900	6,970	31,850	47	62	
980	6,970	31,428	48	61	

* "Strains which are higher than the original limit of stretch will raise that limit immediately after the strain is applied. During succeeding rest this limit is raised beyond the strain applied. This raising of the limit of stretch becomes noticeable after a day, but continues for weeks, months and years."—Bauschinger's Mittheilungen, 1886.

† The influence of speed of testing on the results of tensile tests is well known. Extensive investigation, however, has shown that at present we have no reliable data to prove the necessity of fixed speeds for testing our materials of construction, like iron (and steel) of all kinds, copper, bronze.—From the conclusions of the International Conference for uniform methods of testing.

Washington News.

(From our Special Correspondent.)

WASHINGTON, D. C., November 20, 1894.

Secretary Herbert and the chiefs of the department bureaus, in anticipation of the annual report of the former, have gone over every branch of their work, particularly in the construction branches.

The report of the Secretary is now practically completed, but will not be sent to the printer before next week. He has been disposed from the beginning to include at least two battle ships among his recommendations. He said to-day: "It takes time to build a battle ship. We have enough for the present of the cruiser class. I think we should add to our strength in fighting ships."

The Secretary had some misgivings as to the prospects of securing authority for any additional ships just now from Congress. As it will take some months to compass the preliminaries of their construction, the views in the department generally favor an urgent call upon Congress not to delay this work any longer.

The board for the trial of machine guns are collecting the results of their first series of trials with a view to the series now proposed under conditions of actual service. As soon as this series shall have been completed they will be prepared to select a type gun.

The meeting of the naval architects and the papers read are attracting great attention among officers in the department. The views of Admiral Mead and Commodore Melville seem to enlist the larger share of comment. This is particularly the case in reference to the triple screw. In this discussion it is shown that Commodore Melville is far in advance of some officers at least. The triumphs of speed which he accomplished on the "Columbia" and "Minneapolis" are the practical evidences of the utility of the triple screw.

The expert steam engineers in the department admit that there "are some things yet to learn concerning the triple screw, but its success for power and speed has been amply demonstrated. The data will be accumulated to show the economy of this system for ships of the 'Columbia' class." Commodore Melville has claimed from the beginning that not only speed, but maximum economy of consumption of fuel under all conditions will be reached by this system through the independent action of each screw, the center screw alone being used for slow cruising. A schedule of tests has been prepared which will show every phase of the working of the triple screw.

Commodore Melville, notwithstanding the doubts suggested by some officers whose opinions are generally sagacious on subjects outside of the particular range of their professional training and experience, says that the triple screw has come to stay and will ultimately be the only means of reaching the highest rate of speed, that it will be found to possess many points of superiority over the double screw, especially in the distribution and application of power.

The additions about to be made to the machine tool equipment of the Washington Navy Yard will make another long stride toward having that gun making plant the finest in modern appliances in the world. It does not seem

possible that that vast aggregation of machinery on the most extensive and powerful scale could be the creation of such a comparatively brief period of time.

The machine tools now to be added to the Washington gun foundry and gun carriage plants will enormously extend its capacity and scope of work. There will be two slotting machines for the very heaviest work; four horizontal boring and drilling machines to bore to the center of a 69 inch circle; a 12-foot boring and turning mill; electric traveling cranes of the newest patterns and with supports and runways weighing 228,000 pounds; four planing machines, 14 and 18 feet long and 4 and 8 feet high and wide. In the new equipment will also be portable drills, engines for special branches of the work, boring, drilling, milling and shaping machines, differential pulleys, hoists, &c.

In order to accommodate these new acquisitions to the mechanical appliances of the Washington gun plant some extensions of the buildings will be made. This establishment has at length reached a scope worthy of the Government.

The approach of the time for the meeting of Congress is already noticeable by the number of Senators and Representatives already in the city.

In the Senate parties will be evenly balanced, leaving the fusion Senator from North Carolina with the deciding vote. This is reached in this way: present strength of minority, 37; vacancies in Washington, Wyoming and Montana, 8; gains in West Virginia and New Jersey, 2; the Nevada Senators off on silver, 2, which will make a tie. If they decline to co-operate with their former associates the present minority will remain so, as far as powerful independent action is concerned.

Among the majority members of the House, the uppermost question is what disposition to make of the odds and ends of legislation in the three brief months of the closing session of the Fifty-third Congress. There are some undisposed of tariff reform projects in both Houses. These will doubtless be allowed to lapse. Any attempt to carry out such repudiated schemes of economic legislation will not be tolerated. Therefore tariff reform agitation will take a rest, a permanent one, it is believed.

THE WEEK.

The system of co-operative building associations has taken very firm root in Pennsylvania. According to the latest returns 250 of these associations have been chartered in the State since June, 1891, and the whole number is now stated to be 1239. The membership is 272,580; cash income in one year is \$44,432,686, and the assets, \$103,943,364. These assets represent the accumulation of an average period of about seven years, and it is estimated that in the last 10 or 12 years another \$100,000,000 has been returned to the members in cash and redeemed mortgages, and nearly 100,000 homes have been secured through these societies.

It is likely that the proposed new railway bridge over the Delaware River will be commenced within a very short time. The details of the plan have been approved by the War Department, and the officials of the Pennsylvania Railroad have made application to the Philadelphia Board of Port Wardens for permission to begin the construction.

It is announced that the work, once started, will be pushed forward rapidly.

The International Postal Congress will meet in Washington, D. C., in 1897.

Tests of a new locomotive, constructed to use crude petroleum instead of coal, were successfully carried out last week on the Baltimore & Ohio Railroad between Baltimore and Philadelphia. The engine is reported to have steamed very rapidly and to have emitted little or no smoke. The locomotive was built at the Baldwin works in Philadelphia under the directions of Superintendent Vauclain.

Several of the transatlantic steamship companies have recently issued strict regulations forbidding their agents in Europe to book as passengers for the United States certain undesirable classes of emigrants, including paupers, deaf and infirm persons, persons under contract, assisted emigrants, persons who within a year have been convicted of crime and anarchists.

The United States consul general at Frankfurt reports to the State Department that American securities are now held in such distrust at that money center that not only are new investments of all kinds uniformly refused because of their American origin, but large quantities of railway bonds and stocks which have been held there for years past have been recently returned and their proceeds invested in Prussian consols and other domestic securities. Mr. Mason believes that the existing American system of receiverships for bankrupt railroads, whereby the president or a director of the defaulting company is given the office of receiver, has done more than anything else to shake European confidence in American railroad securities.

The trade returns of Canada for the first four months of the current fiscal year show a falling off in the foreign trade of the Dominion during that period amounting to \$8,744,305.

The Delaware & Hudson Canal Company have given notice that the canal will close for the winter on December 1. The past season is said to have been a very unprofitable one.

The report of the California State Mineralogist states that during 1893 California more than doubled the silver output of the previous year, producing \$537,155, as against \$262,530 in 1892. The gold output was nearly the same for both years. This year 49 mines are being operated, and the State Mineralogist believes they will increase gold output by from \$12,000,000 to \$16,000,000.

George H. Murphy, United States Commercial Agent in Luxemburg, in a recent report to the Government, gives a number of interesting figures in regard to the wages paid in that place, which are, he says, about the same as are paid in other sections of Germany. He finds after exhaustive examination that the average earnings of ordinary workmen amount to something less than \$200 per annum. Women earn about half as much as men.

The American Institute of Electrical Engineers has just completed its first decade.

The Iron Age

New York, Thursday, November 22, 1894.

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JOHN S. KING, - - BUSINESS MANAGER.

Pig Iron Production in the Central West.

We fear that remarks recently made in *The Iron Age* concerning the production of pig iron have been misunderstood by some and that they have been deliberately misinterpreted by others. We called attention to the fact that practically the whole of the furnace capacity in the Central West is fully occupied, and that this covers the area in which cheap Bessemer pig can be made. This circumstance is one which should not be lost sight of by the trade during the next six months. Until lately consumption has taken up the current make very closely. In fact, it has been a matter of a good deal of surprise to those who have watched developments that the make of pig iron in the districts embraced in the Central West was taken so rapidly. Including the Chicago district, Pittsburgh, Wheeling and the Ohio River, the Valleys, Johnstown and the Cleveland district in this general field, we find that on November 1 there were 81 coke furnaces blowing, which were producing close to 106,000 tons of pig iron weekly, the great bulk of which is of course Bessemer iron. Outside of this region there is only one section, north of the Potomac and Ohio and east of the Mississippi, which can make equally cheap pig iron, and that is the Lebanon in Eastern Pennsylvania.

The tremendous inroads which Western soft steel and Western rolling mill products have made into Eastern territory have kept the output keyed up to a high pitch. With the declining demand incident to the approach of winter, a surplus is developing, and since there was considerable leeway between cost and selling prices, the latter have given way. But let the railroads return to their normal requirements, then clearly the Central West cannot supply the demand. It will either be forced to withdraw from the Eastern markets or must develop its capacity greatly.

There are indications that this is being done. Two new furnaces will be completed at Duquesne by the middle of 1895, out of eight which are to constitute the plant ultimately. A mill in Wheeling has an additional stack nearly ready to blow in. A second Wheeling concern is rebuilding an old furnace and then it, too, will be independent of the open market. On the other hand, the Lorain steel plant will be ready to start in April, 1895, with a consumption of pig iron of

over 1000 tons per day. The great furnace plant of this concern, for which the plans are now completed, covering four stacks, will not come into play until late next year.

Considerable importance is being attached to the entrance of the Ohio Steel Company into the market, with its capacity to convert close to 1400 tons of pig iron per day. It is claimed that the requirements of this concern will take care of a large tonnage which now finds its way into the open market. While this view is well supported, it must be borne in mind that the new seller is not making its own market, but will dispose of its product to former customers of Pittsburgh and other districts.

It is clear, therefore, that before the middle of next year there will be only moderate additions to furnace capacity and that then a large new consumer will make its appearance. So far as the immediate future is concerned the tremendous output in the Central West seems likely to overshadow the consumption of a dull winter. It is an open question whether accumulations of iron during that period will be ample enough to act as a fly wheel in carrying the trade over the notable increase in the demand which spring is confidently expected to bring. Much, of course, will depend upon developments in the rail trade. If next year's tonnage is anywhere near what it ought to be in ordinary times, a tremendous pressure will be put upon the capacity of that part of our country which is able to make iron at present prices at a moderate profit.

The Railroad Strike Commission.

It is unpleasant to record the failure of honest attempts to settle great and exceedingly important questions. All parties hailed President Cleveland's appointment of a special commission to investigate the late railroad labor disturbances at Chicago as a wise movement. It was felt that even if the commission should be unable to suggest a practical method of avoiding future outbreaks of the same character, a thorough investigation of the causes leading up to the trouble would have a wholesome effect on the subsequent relations of employer and employed. In the heat of a bitter contest both parties are apt to take positions which are indefensible. A dispassionate inquiry and a cold statement of actual facts by disinterested parties should then assist reflection and cause errors of judgment to be so plainly seen that they would afterward be avoided. But the essential duty of a commission is to ascertain facts and establish them beyond controversy, as the basis upon which to make recommendations or to offer suggestions.

In this fundamental principle the Federal Strike Commission has fallen woefully short of the high expectations entertained when the names were announced of the distinguished gentle-

men who had been selected for this delicate investigation. Their report is incomprehensibly inaccurate and strangely biased. The issue of actual veracity has been raised by a cloud of witnesses, and if the report shall be received and made a part of the archives of the Government there seems to be a necessity for a companion document making the necessary corrections for the guidance of the historians of the future.

Malleable Castings from Coke Iron.

The manufacture of malleable castings has long been an important branch of the American foundry trade. Lightness with strength is the object aimed at in the production of innumerable articles. Few people on the face of the earth are so perpetually at war with clumsiness and even the appearance of heaviness as Americans. Safety and durability are not lost sight of, but are always carefully considered, after which comes the question of avoiding the use of surplus metal, except in cases in which very great strength can only be secured by means of ponderous masses of material. But in building machinery for light manufacturing, or for rapid movement, or for agricultural purposes, everything in the nature of surplus weight is rigorously eliminated. Agricultural implements and vehicles, as made by American manufacturers, are almost marvels of lightness and strength, so thoroughly has the question of easy draft been studied. In mechanics' tools, hardware specialties, builders' hardware, saddlery hardware and house furnishing goods the same conditions are apparent. Mere dead weight is avoided unless it is an essential feature of the article itself. To this feature of American manufactured products the makers of malleable castings have made valuable contributions. They have been alert and progressive, and the very large establishments in numerous localities making a specialty of malleable castings testify strongly to the hold which this class of products has secured on the trade of the country.

The peculiar excellence of American malleable castings has until recently been attributed in no small degree to the character of the pig iron used. Lake Superior charcoal was regarded as the ideal material, being smelted from very rich pure ores, with the purest of fuels. Producers of Lake Superior charcoal iron therefore regarded the malleable casting trade as one of their own particular possessions, secured to them by natural laws. But the Western manufacturers of coke pig iron have rudely interrupted the even tenor of their way, and are not only inducing the malleable casting makers to use a mixture of coke with charcoal iron, but seriously threaten to absorb the entire trade. A revolution, therefore, seems to be impending in the manufacture of malleables. Two factors are at work in bringing about this re-

sult: One is the desire of the malleable foundrymen to secure cheaper material than charcoal iron and the other is the effort of coke iron producers to widen the consumption of their product. The experiments made in the introduction of coke iron have therefore proceeded with the active co-operation of both interests. Bessemer iron was taken as the basis of experimentation, as it approaches most nearly to the chemical composition of Lake Superior charcoal iron. These experiments have extended over a period of about three years, and Western makers of malleables do not now hesitate to say that they can make thoroughly satisfactory castings from coke iron exclusively. They have had some prejudice to overcome from their customers who were skeptical of good results from any other material than charcoal iron. This prejudice, however, is rapidly disappearing when the fact is demonstrated that the coke malleables are by no means the inferior goods which they feared. Some malleable foundrymen were also prejudiced against the use of coke iron at its inception, but they have been persuaded to adopt it by the force of circumstances, among which may be mentioned the powerful lever of lower prices made by coke consuming competitors. An instance is noted of one maker of malleables who bought a carload of coke iron for trial, which became mixed with the charcoal iron in his yard and could not be afterward identified. The castings were carefully watched until the stock was cleaned up, but no ill effects whatever were perceptible from the mixture. It is needless to say that coke iron rapidly grew in favor with this establishment.

The substitution of coke iron in this class of castings is another triumph of the chemist. The manufacturers of malleables who use coke iron do not hesitate to say that they are now more certain of results than when they depended exclusively on charcoal iron. The method adopted by the coke iron producers is to analyze every carload of iron destined for malleable purposes, so that the consumer knows precisely what he is getting. He is then able to determine the exact treatment to be given to the iron in each carload to secure a specific result. His work is not done at haphazard but with as nearly exact knowledge as it is possible to get. To meet such conditions the producer of charcoal iron must not only sell his product at an even price, but must also furnish an analysis of each carload, as the mere fact that the iron is smelted with charcoal is not accepted as a guarantee of uniformity nor even of superior fitness for the purpose. The conditions thus imposed bear heavily on the charcoal iron producer who is handicapped by the high cost of his fuel and cannot well afford to incur much additional expense. The consumer, however, is greatly benefited as the cost of malleable castings has been reduced in conformity with the reduction made in the cost of the raw material.

Merchant Marine and the Navy.

Perhaps the most important result of the meeting last week of the Society of Naval Architects and Marine Engineers was the publishing of the fact that the merchant marine of the United States should be and must be developed before it is even possible to have an adequate navy. This opinion was held by a large majority of those present at the convention, irrespective of training or profession. Naval officers, engineers, designers and builders of naval and merchant vessels were practically unanimous upon this point. It was the expressed conviction that the United States should first assume the position on the high seas to which it is entitled, by the re-establishment of its merchant marine, and that this would be followed, of necessity, by the production of a navy of like magnitude and to the same degree of perfection.

There appears to be but one method by means of which this can be accomplished, although the details of its execution may vary widely. The Government must encourage and foster the building of American vessels and the sailing of these vessels under the American flag. Whether this could best be done by the payment of a subsidy for carrying the mails, or by any other plan is of minor importance, as the vital item is the giving of a subsidy for the encouragement of the merchant marine; the method of the giving is of comparative insignificance. Many arguments were advanced to prove that Government aid was absolutely essential. It was thought that the bounty or premium should be sufficient to offset the difference in the cost of a ship built here and one built abroad, this difference being due largely to the greater rate of wages paid here. The premium should also be ample to cover the greater cost of running a vessel under the American flag as compared with one sailing under a foreign registry, this also being due, to a large extent, to the higher wages that would have to be paid American seamen. Under these conditions an American vessel of a certain class would be on equal terms, as far as competition was concerned, with a foreign vessel of the same class.

The advantages to be derived by the Government from a large merchant marine are many and varied, and are not confined entirely to times of war; they are evident in times of peace. The merchant marine would serve as a training school from which men for the navy could be recruited as needed. The desirability of this feature alone can hardly be overestimated since, no matter how large and perfect the navy may be, it is next to impossible for it to train all the men it may require. At the convention above mentioned it was stated that it would be cheaper and better for the Government to pay \$150,000 a year to the owners of a merchant vessel costing \$2,000,000 than

it would be to build a war ship costing \$2,500,000. The reasons advanced in support of this were in substance as follows: Counting wages, running expenses and repairs, it would cost about \$150,000 a year to keep the war ship in commission, while the benefit to the country at large would not be so great as in the case of the merchant ship. The latter would be productive while the former would be non-productive, and its advantage would be prospective, or in other words its peculiar qualities would be made use of only in time of war. By paying this bounty for a merchant ship the Government would have at its command, in time of need, a vessel that could be quickly transformed into an efficient fighting machine. Such a ship would always be kept in perfect trim, as regards hull and machinery, would have a competent corps of engineers on board, and would therefore be ready for instant duty in the navy. The opinion prevails that a large merchant fleet would supplement the regular navy as cruisers, transports and in other ways. Without a merchant marine it is considered, by those best qualified to judge, to be impossible to build a navy; and, therefore, those who are most anxious for the United States to have a navy superior to that belonging to any other country believe in the establishment of the merchant marine first—the navy will then appear, because there will be an imperative demand for its services.

OBITUARY.

HON. GEORGE M. RICE

Hon. George M. Rice, president and treasurer of the Worcester Manufacturers' Mutual Insurance Company and at one time president and proprietor of the Worcester Steel Works, died at Worcester, Mass., on the 8th inst., of disease incident to old age. The deceased was born in West Brookfield, Mass., in 1808. After receiving a common school education he went to Worcester in 1829, and in 1846 with others he organized a company for the manufacture of paper, calico printing and bleaching machinery, a concern which afterward merged into Rice, Barton & Fales. Mr. Rice retained his connection there until 1881, when he became interested in the Washburn Iron Company, the principal interest in which passed into his hands in 1883, when he became president of the company. Although over 70 years of age, he invested a large amount of money in these works and took upon himself the task of remodeling them, with the object of manufacturing steel rails, ingots and iron car wheels under the corporate name of the Worcester Steel Works. In 1883-84 a Bessemer steel works was added to the plant, and later on open hearth furnaces were put in, and in 1888 two trains of rolls were added for the manufacture of merchant steel. In September, 1890, the corporation became embarrassed through the failure of the Potter & Lovell Company, and on October 6 the company made an assignment. After considerable litigation the steel works and Mr. Rice's estates paid a small dividend. That was the end of Mr. Rice's career as a manufacturer. Mr. Rice was president and treasurer of the Worcester

Manufacturers' Mutual Insurance Company from the time of its reorganization in 1861 until his death. He was also one of the founders of the Worcester Safe Deposit and Trust Company, and had been prominently identified with many other enterprises in Worcester. He served two terms in the Massachusetts Senate, and for three years was president of the Common Council of Worcester.

COLONEL JESSE R. CRAWFORD.

Colonel Jesse R. Crawford, ex-Register and Recorder of Mifflin County, Pa., and the senior member of the iron manufacturing firm of Crawford, Johnson & Co., died at his home at Gaysport, Pa., on November 14, aged 84 years. He formerly held the position of Superintendent of the old Portage Railroad, the pioneer railroad of Pennsylvania.

ORVILLE H. STEVENS.

Orville H. Stevens, president and treasurer of the corporation of Blake & Johnson of Waterbury, Conn., died on the 16th inst., after a brief illness, at a sanitarium, at Wernersville, Pa. Mr. Stevens, who was born at Clinton, Conn., March 31, 1824, came to Waterbury at the age of 28 years, and a few years later became connected with Blake & Johnson, machine builders. His life was largely devoted to the success of this firm, and their prosperity has been due in a great measure to his ability and perseverance. During the past 20 years he had served the city of Waterbury in almost every local office within its gift except that of Mayor.

The Connellsville Coke Trade.

The output of coke in the Connellsville region has more than doubled during the past four months and indications are that the output of 1894 will exceed that of 1893 by nearly 500,000 tons, in spite of the long strike in the summer. The output in September was very large, but in October it was heavier by about 65,000 tons and the output for the present year is expected to reach very close to 5,500,000 tons, and may exceed that figure. This has been exceeded but three times in the history of the region. In 1889 the output was 5,825,826 tons; in 1890, the boom year, it was 6,221,518 tons, and in 1892 it ran up to 6,300,000 tons. On account of the very low prices ruling for coke during all of this year the gross sum realized for the product of 1894 will be less than has been received by the operators since 1885, when there were but 3,096,012 tons sold. In detail the output of 1894 to November 1 is as follows:

Month.	Tons.
January	398,171
February	411,840
March	507,949
April	376,658
May	75,334
June	174,340
July	307,980
August	517,184
September	611,472
October	708,707
Total	4,117,585

The output for the corresponding period of 1893 was only 4,364,368 tons. There can be no comparison because of the fact that the trade of this year went through a six months' strike.

The monthly shipments and the daily averages in cars for the ten months of 1894 were as follows:

Month.	Pitts.	West.	East.	Total.	Dayly
Jan.	7,696	7,932	4,690	20,318	752
Feb.	8,266	8,798	4,686	21,744	906
March. ...	9,275	11,620	5,507	26,402	978
April ...	7,085	9,888	3,046	20,019	800.
May.	2,425	1,675	274	4,374	162

June....	5,824	3,442	1,093	10,359	400
July ...	8,179	5,650	4,194	18,023	693
Aug. ...	8,805	11,964	5,643	26,352	978
Sept....	9,556	16,632	6,042	32,230	1,239
Oct....	11,891	17,917	5,885	34,693	1,296

Total 79,002 95,458 41,054 215,514 822

The total October shipments have been exceeded but once. In January, 1890, the month's output was 35,455 cars. The daily average has been exceeded twice. In January, 1890, it was 1313 cars and in December, 1889, it was 1309 cars. In point of tonnage, however, the output of last month has never been equaled. The cars were more heavily laden than ever before, averaging full 1 ton per car more than the shipments of 1889 and 1890.

CORRESPONDENCE.

Freight Rates on Tin Plate.

To the Editor: I have read with much interest the article in *The Iron Age* of November 8, in which Mr. Leeds shows that our railroads are not doing what they might to help on the tin plate industry in our country; but Mr. Leeds did not show all the facts as they are with us. The open freight rate from Swansea, Wales, to St. Paul is 29 cents per 100 pounds, while the rate from a certain factory in Indiana to St. Paul is 30 cents per 100 pounds. Just notice the difference in miles of railroad alone. I have worried over the position of our tin plate factories almost as much as though I were an owner; and why not? In our business we use many thousands of boxes each year, and the old way was to contract in Wales for several thousand boxes ahead of our actual wants and take the chances of the market; while since we began to buy from our own factories we have been able to carry a smaller stock and get it into our warehouse in much better shape—hardly a box being broken, while in foreign shipments almost every box was in bad condition.

Furthermore, the American factories were already making better qualities than foreign, and improving every day. What can be done? Restore the duty, and in a short time our internal competition will be such that the foreign maker cannot compete even if no duty was in force, but the conditions just now are such that the railroads should help the jobbers and manufacturers out by making a low rate of freight to compete successfully with foreign shipment. To conclude I show rates from Swansea, Wales, to different points in the United States:

	100 pounds. Cents.
Baltimore.....	5.0
Boston.....	6.6
Buffalo.....	12.0
Chicago.....	9.8
Cincinnati.....	9.3
Cleveland.....	7.1
Columbus, Ohio.....	9.3
Denver, Col.....	74.9
Detroit.....	7.1
East St. Louis.....	14.2
Indianapolis.....	9.3
Kansas City.....	25.6
Louisville.....	9.8
Milwaukee.....	9.8
Minneapolis.....	29.0
Memphis.....	17.5
Nashville.....	19.1
New Orleans.....	3.3
Omaha.....	25.6
Philadelphia.....	5.0
Pittsburgh.....	7.1
St. Joseph.....	27.3
St. Louis.....	16.4
St. Paul, Minn.....	29.0
Sioux City.....	27.3

T. G. WALTHER.

ST. PAUL, MINN., November 12, 1894.

PERSONAL.

Professor Thomas Egleston of Columbia College has returned from his summer travels in Europe.

Eckley B. Coxe of Driften, Pa., has resigned the presidency of the Delaware, Susquehanna & Schuylkill Railroad, Coxe Bros. Iron Foundry & Mfg. Company, and the Cross Creek Coal Company. Alfred Walters succeeds him. Mr. Coxe will continue his interests, but will give his personal attention to other matters.

John M. Evans, who has just been appointed general manager of the plant of the Sharon Iron Company, Limited, of Sharon, Pa., has been connected with the Illinois Steel Company of Chicago for the past two years, in charge of their structural department. He has had long experience in the iron business. Prior to his engagement in Chicago he was identified with the Youngstown Rolling Mill Company of Youngstown, Ohio, for a number of years, occupying an official position of responsibility connected with the management. Mr. Evans has won many friends during his residence in Chicago, who are pleased to hear of his advancement.

Harry Bonnell of the Mahoning Valley Iron Company, Youngstown, Ohio, has returned home after a two months' visit to England.

Andrew Carnegie arrived in Pittsburgh last week and will remain in that city for some days yet. He is expected to visit the various plants of the Carnegie interests during the present week.

Duluth News

The iron ore shipping season at the Lake Superior mines is over, the last ore having been sent forward this week. Most of the mines shut down a week ago, and at once turned their attention to the winter's work. A careful summary of the operations in progress and to be started soon on the several ranges leads to the statement that there will be nearly as many men employed this winter as in former prosperous times, the difference being the smaller number needed for the same output by reason of the opening of the labor saving Mesaba Mines. At these, too, there will be very large forces kept at work, for the amount of opening to be done, both in the open pit and the underground mines, will be very great. Wages are low, but the number of men is likely to be 50 per cent. greater than it was a year ago.

No new work is going on at any of the older ranges, though there is some likelihood that one or two new mines will be opened on the Vermilion in addition to the Pioneer, which is being put into shape for a large output another year. On the Mesaba all the new work is going on. At the west end of the range, at the Hibbing deposits, which were described at length in *The Iron Age* some months ago, three large companies are at work with heavy forces, and the output of ore from that one deposit is expected to be not less than 600,000 tons next season. The work there consists of the stripping contract for moving 300,000 cubic yards for the Mahoning Ore Company from a mine which they expect to work by steam shovels, the underground work of the Lake Superior Iron Company, which is being done by the Consolidated Mines, and where they expect to mine 250,000

tons next season, and the work of the Sellers Ore Company of Shoenberger, Speer & Co. Further west the Virginia deposits and those around the Adams mine are being vigorously opened for next season's mining, and the Oliver, Franklin, Auburn, Norman, Adams, as well as the several new options of the Minnesota Iron Company and some other properties, are all showing signs that indicate large outputs of ore for the season of 1895. At the Biwabik group there is a good deal of exploration, and the Minnesota Iron Company are putting their Canton mine in shape for a very considerable output. The Hale and Biwabik, as well as possibly the Cincinnati, will be operated to some extent during the winter, in preparation for the coming season.

If all these mines of the new range do what is claimed for them, there will be an immense amount of ore shipped out of Duluth County in the year 1895, and there will either be a great overproduction or mines elsewhere will be obliged to curtail still more.

The Anthracite Situation.

Rumors have been very plentiful recently concerning sharp cuts in prices of anthracite coal to the line trade. The circumstances are somewhat complex. When the bituminous coal strike occurred this summer the anthracite interest expected a sharp increase in the demand. This did not take place to the extent expected, the estimated increase in tonnage having been only about 1,000,000 tons. The anthracite interests were slow to recognize that the added demand was not as great as expected, and continued to mine large quantities. Production was not cut down sufficiently. When October arrived the sales agents reluctantly attempted to meet prevailing conditions. One large interest agreed to the allotment made for that month and yet broke its pledges a few days later. Another interest which was supposed to have given its adherence verbally fell back upon the ambiguous assent given to justify independent action. In the mean time tidewater prices crumbled away under the pressure to dispose of surplus product. At the same time the leading interests attempted to recoup by advancing prices to the line trade. This brought about the vigorous protest on the part of the individual operators of whose action so much is now printed in the newspapers.

It is estimated that about 80 per cent. of the total amount of anthracite coal produced is mined by individual operators, the majority of whom ship over the Lehigh Valley Railroad. The largest of these individual operators are Cox Bros. & Co., who, however, have special arrangements with the railroads, because they haul their coal to tidewater with their own engines, cars and train crews. The others have an arrangement under which they receive 60 per cent. of the selling price of coal at tidewater, for their coal on cars at the mine, the coal being handled by the Lehigh Coal Company. As a minimum \$3.25 at tidewater for stove coal is fixed in the contract.

Now, by far the greater part of the coal mined by the individual operators goes to tidewater, although fully two-thirds of the anthracite coal mined does not go in that direction. It will be readily understood that the leading railroad interests, with whom tonnage is the first consideration, may find it to their advantage to permit an overstock-

ing of the tidewater markets and a corresponding decline in prices, because the coal mined by the individual operators must bear the greater part of the burden.

Every one of the great coal roads has its line trade which it controls more or less completely. For that trade the company coals are reserved and the deliberate attempt has been made to make this line trade pay a higher price for the coal than is paid in tidewater markets. The injustice of such a proceeding, both to the individual operators and to the consumers along the line, is flagrant. It has led to the demand on the part of the individual operators upon the Lehigh Valley road to make prices to the line trade harmonize with those at tidewater. It has led to the report that Cox Bros. & Co. will sell their coal on the basis of price f.o.b. mine.

So far as we can learn the struggle is one which will not very materially affect the cost of production of iron by those manufacturers who largely use anthracite as a fuel.

MANUFACTURING.

Iron and Steel.

A large new fly wheel is being installed in the rod mill of the New Castle Wire Nail Company, New Castle, Pa. It is being built by the Bass Foundry & Machine Company of Fort Wayne, Ind.

The Ellwood Tin Plate Company, Ellwood City, Pa., have just completed the erection of a tinning house. It is equipped with four tinning sets, while provision has been made for the erection of six more. This plant has been idle for some time, pending adjustment of the wage scale, but when operations are resumed two Morewood and two Thomas-White tinning sets will be started.

We are advised that the statement that the plant of the Duquesne Tube Works Company of Pittsburgh, Pa., would resume operations in all departments, after an idleness of six weeks, is without foundation. The facts are that a part of the plant was put in operation on Monday, the 19th inst., on some special work, but how long operations will be continued depends altogether on receipt of orders, which have, as yet, not been booked.

At a meeting of the Board of Directors of the Norton Iron Works, Incorporated, Ashland, Ky., held on October 24, a committee was appointed to take up the question of leasing the blast furnace of this concern. The cut nail factory resumed operations on Monday, November 12, after a shut down of about eight weeks, and the prospects are that it will continue in operation for the next two months at least. The factory contains 126 nail machines, the annual capacity being 350,000 kegs of nails.

A number of the rail straighteners formerly employed at the Edgar Thomson Steel Works, Bessemer, Pa., but who were discharged for going out on a strike, have gone to Youngstown, Ohio, and will enter the employ of the Ohio Steel Company, of which Thos. McDonald, formerly superintendent of the converting department at the Edgar Thomson Steel Works, is general manager. It is claimed that in one turn of 12 hours last week the new men imported to take the place of the rail straighteners who were discharged straightened 1640 tons of rails.

The old Darnell mill at Muncie, Ind., has been put in full operation by J. D. Briggs of Findlay, Ohio, making puddled iron for his Findlay rolling mill. It had been running with a larger force than for many months up to the 15th inst., when a serious accident occurred. The mud drum attached to the boilers tore loose from its fastenings, fatally scalding one man with hot mud and terribly burning four others.

We are advised that the statement that the New Castle Wire Nail Company, New Castle, Pa., were installing some patent wire nail machines is untrue.

The Sylvan Steel Works, at Moline, Ill., have started their rolling mill in part and

expect to have the entire works in running order by December 1. They will make a specialty of bars and agricultural shapes.

Among recent incorporations in Wisconsin is that of the Milwaukee Malleable Iron Company; capital, \$100,000; incorporators, John Klapinski, Julius Rost and Frank Giesler.

The Atlanta Steel & Tin Plate Company of Atlanta, Ind., write to us under date of November 15: "We are in constant receipt of mail addressed to the Indiana Tin Plate Company, Atlanta, Ind. Will you kindly publish the fact that the Indiana Tin Plate Company has been superseded by the Atlanta Steel & Tin Plate Company, Atlanta, Ind.? We are erecting three mills. The tinning house with eight stacks is already in working order and we expect to put that department in operation in ten days."

A press dispatch from Birmingham, Ala., to the New York dailies, says that the City Council of Bessemer has closed a contract with the Bessemer Land and Improvement Company by which the city buys the water works from the company for \$125,000 and the company agree to expend that amount and \$200,000 more in the erection of a steel plant. The company's officers say that work on the steel plant will begin at once. It will be the first plant of its kind in this district.

The shipments made by the steam forge department of the Reading Iron Company, Reading, Pa., the past few months have exceeded those made during the same period last year more than threefold. The increase in shipments the past few weeks over those for the same period last year, including forgings of every description, amounts to over 203,000 pounds, which has necessitated an increase in the working hours of many of the hammers and putting others on double turn. Among the heavy work now under way are four shafts, 26 inches and 28 inches in diameter, which are to be finished complete, with keyways, in their shop, the total weight of which will be about 140,000 pounds. A number of smaller shafts, 18 to 24 inches in diameter, are also under way and are nearing completion, and every indication points to an active and hopeful future.

The receivership of the Cofrode & Saylor Bridge Works, Pottstown, Pa., and the Reading Rolling Mills Company, Reading, Pa., is expected to terminate by January 1. Notice has been given that application with that end in view will be made to the court in Philadelphia, as the creditors and stockholders of the two corporations have assented to the plans of reorganization.

All the preliminaries in the way of procuring a charter, making surveys, &c., for the proposed iron and steel mill at Hyde Park, Pa., have been completed and the order given to rush the work to a finish. The \$75,000 stock has all been subscribed for and the following officers elected: President, J. D. Orr; vice-president, J. M. Fiscus; secretary, E. F. Schanwecker; treasurer, T. S. Irwin. The main structure will be built of iron, 113 x 175 feet; annealing house, 50 x 100 feet; wareroom and packing house, 50 x 100; boiler house, 65 x 75 feet. The mill will be fired with natural gas, and its product will include black plates, sheet steel and iron. It is intended that the plant will be in operation by March 1.

William Ward and Wm. B. Broomall, trustees, have entered *feri facias* executions to the amount of \$55,190, against the Eureka Cast Steel Company of Chester, Pa., and judgment was confessed for \$27,295, upon which execution has been entered. The company are capitalized at \$75,000, paid in, and manufacture all forms of railroad and machinery castings. It is stated that they have conducted a profitable business for years, but that their resources have been exhausted by several disastrous fires and the trouble in making collections during the depression. The latest fire occurred in August, 1893, and destroyed the foundry and outbuildings, causing a heavy loss. After this fire a new and improved foundry was erected. Members of the firm hope that they may be able to arrange matters and resume business within a short time.

The McDaniel & Harvey Company, Philadelphia, report that they are running their sheet iron mills at their full capacity. They are about closing a contract for rebuilding their bar mill at North East, Pa., which was burned a short time ago. Its equipment will be about the same as the old mill, with the exception of the engine, which will be a 250 horse-power Reynolds-Corliss, the order having been given to the E. P. Allis Company for the same.

The business of the manufacture of open hearth steel castings formerly carried on by the Anderson Steel Casting Company, 132 Meridian street, Indianapolis, Ind., has been purchased by the Gould Steel Works, and will hereafter be carried on by that concern.

The New Castle Steel & Tin Plate Company, New Castle, Pa., will add a second pickling machine to their plant, and have placed the order for it with the Leechburg Foundry & Machine Company of Pittsburgh. When the plant of the New Castle Steel & Tin Plate Company was put in operation it was equipped with a pickling machine of foreign make, and when the increased business of the concern made it necessary to install a second pickling machine it was decided that the Mesta pickling machine, made by the Leechburg Foundry & Machine Company, was superior to all others, and therefore the order was given to that concern.

The cut nail factory of the Laughlin Nail Company, Wheeling, W. Va., has been put in operation after an idleness of about three months. The factory of this concern is the largest in the country, and contains 226 nail machines.

We are advised that the statement that a large lot of new machinery has been installed in the plant of the Sharon Iron Company, Limited, Sharon, Pa., is without foundation. The statement is also untrue that the sheet mill of this concern has been closed down for 18 months. On the contrary, this department has been in full operation right along.

At Youngstown, Ohio, a company is being formed for the purpose of engaging in the manufacture of cold polished shafting under patents owned by C. Seymour Dutton and P. M. Hass. Mr. Dutton was connected for many years with the firm of Wm. Tod & Co., engine builders of Youngstown, but severed his connection with that concern about a year ago.

At a meeting of the Pittsburgh Freight Committee, held in that city last week, it was decided that the revised rates of freight on articles of iron and steel manufacture, from Pittsburgh to Chicago and other Western points of shipment, which were to have gone into effect on December 1, be postponed until January 1, 1895, or if necessary, until February 1. The reason given for the postponement of the date on which these rates were to go into effect is that the different agents did not have sufficient time in which to prepare the revised tariff.

Machinery.

The American Mining Machine Company of Pittsburgh have made application for a charter of incorporation. The incorporators are George Francis Meyers, Reed B. Coyle, A. C. Munhall, Louis L. Broughton and J. H. Palmer, all of Pittsburgh.

The Diamond Drill & Machine Company of Birdsboro, Pa., capitalized at \$10,000, have been chartered under the laws of Pennsylvania.

William B. Wemple's Sons, foundrymen, of Fultonville, N. Y., have made an assignment to John H. Morrison. This business was established more than 40 years ago.

The Crescent Machine Works, at Leontonia, Ohio, which have been under construction for the past few months, are now ready to begin operations. Saw mill machinery will be the chief product.

The Allentown, Pa., Foundry & Machine Company, who recently failed, have made application for the appointment of a receiver. There was \$8000 on the books when the company failed, and it is to collect this that a receiver is asked for.

The Gisholt Machine Company of Madison, Wis., have recently doubled their floor space and have added a large number of machine tools to their equipment, ten of them being their own standard turret lathes, especially arranged for the most rapid and economical production of lathe work. They have also built a tool room in which they have placed 18 machine tools for getting out the special fixtures required on their turret lathes. The company are now making a shipment of eight machines to various points in Europe; three to Vienna, one to St. Petersburg and four to Berlin.

The Quincy Mining Company of Hancock, Mich., have just placed an order with the Lodge & Davis Machine Tool Company of Cincinnati, Ohio, for an outfit of tools, including several large lathes and two full universal radial drills to be used in repairing and manufacturing mining machinery.

The Geo. Burnham Company of Worcester, Mass., have added to their floor room and installed new machinery, thereby materially increasing their facilities for the manufacture of improved upright and clamp drills.

Wm. Wharton, Jr., & Co., Philadelphia, manufacturers of material for permanent way for street railways, are remodeling and adding to their factory buildings. They are erecting a new machine shop, 41 x 240 feet; a new rail and fitting shop, 41 x 112 feet; a new foundry, 50 x 214 feet, and a new power house. The machine shop will be in part newly equipped, and most of the machinery will be run by directly applied electric power. The power house will be equipped with two 125 horse-power Hoff & Fontaine engines, two Newbold boilers, and a large electric plant. The improvements will probably be completed by February next.

Shipments to the mining fields of South Africa are frequent with J. A. Fay & Egan Company of Cincinnati, Ohio. There is quite a preference toward American machinery, for the slowness and unsatisfactory methods in shipping and setting up of English machinery have turned the British colonists to the productions of the United States.

The works of the J. F. Seiberling & Company, Akron, Ohio, manufacturers of Empire harvesting machinery, which have been closed down since August this year, will resume operations early in December.

Hardware.

The Syracuse Tubular Hame Company, Syracuse, N. Y., have been incorporated to manufacture steel and tubular hames, saddlery goods and hardware. The capital is \$25,000, and the directors are W. H. Emmons, J. E. Ratchford, L. H. Groesbeck and others.

The axe and edge tool works of White & Ham, at Honesdale, Pa., were burned on the 16th inst., causing a loss of \$20,000.

The Knapp & Cowles Mfg. Company, Bridgeport, Conn., are about to erect an addition to their plant. The new building will be 130 feet long and 40 feet wide.

The Archer & Pancoast Company have been incorporated, to manufacture lamps, electroliners and gas fixtures and art metal work in New York City. The capital is \$100,000. The directors are Archer V. Pancoast, Charles A. Cheever, Byron Traver, William S. Fearing, John B. Summerfield, Samuel B. Lawrence, Henry T. Bragg, Clinton S. Howe and Edward Cornell.

The Sperry Cutlery Company of St. Louis have been organized, with a capital of \$20,000. The incorporators are Michael Jordan, P. F. Sperry and H. F. Lansingburg.

P. & F. Corbin, New Britain, Conn., will soon commence work on an addition to their plant to cost \$50,000.

The Iroquois Mfg. Company have been incorporated to manufacture hardware, tools, &c., in Buffalo, N. Y. The capital stock is \$300,000. The directors of the company are Charles Henry Myers, Patrick Henry Hinman, James J. McNally, Henry H. James, Dayton A. Minar and John C. Griffith.

Millbury Razor Company, Millbury, Mass., have decided to double their manufacturing facilities.

The International Rolling Screen Company have been organized at Portland, Maine. They will manufacture a patent rolling screen. The company have a capital stock of \$100,000. J. Allen Crocker is president of the company and M. J. Corliss treasurer.

Clendenin Bros., Baltimore, Md., advise us that in their nail and tack department it is their purpose to gradually take up the full line of nails and tacks as used by the shoe finding and hardware trade. The latest new articles which they are making are iron cobblers' nails, Hungarian nails and channel nails. They are continuing the manufacture of brass shoe nails, copper nails and tacks, and zinc nails and tacks. The firm state that they have been working full time continuously, and on some of the above items are two weeks behind their orders. They are also working full time in their other department, in which they make soldering coppers, copper hammers and any article in copper requiring drop forging.

Articles of incorporation of the Casket Hardware Company of Oshkosh, Wis., have been filed. The capital stock is \$50,000, and the officers are C. C. Paige, president

and treasurer; T. H. Ruddimann, vice-president, and W. H. Huntington, secretary. The company will manufacture all kinds of light hardware and casket trimmings.

An explosion of gas in the brazing room of the Geneva Cycle Company, Geneva, Ohio, on the morning of the 7th inst. damaged their plant to the extent of about \$10,000, which is fully covered by insurance. The work of rebuilding was commenced before the walls were fairly cold, and the entire plant is again in operation.

The Pioneer Bank of Pioneer, Ohio, has just received some handsome work in the way of counter railings, wickets, foot rails, &c., for the banking rooms from the plant of E. T. Barnum of Detroit, Mich.

Fox Machine Company, Grand Rapids, Mich., are doubling their facilities for turning out their steel sash pulleys, which is a line of business which, they advise us, is growing very rapidly. They hope to be able to take care of the spring trade without causing their customers to wait as long for goods as they have been obliged to in the past.

With the completion of their new extension the aggregate floor space in the plant of F. E. Myers & Bro., Ashland, Ohio, is nearly 80,000 square feet. This firm, we are advised, are doing an annual business of nearly \$400,000. Two hundred men are employed in the shops while 17 men represent the firm as salesmen in the different States of the Union. The company are also doing a gratifying export business.

The Meteor Bicycle Company of Battle Creek, Mich., are arranging for the removal of their factory to Saginaw in the same State. The facilities will be considerably enlarged. The Meteor is a machine which was brought out this year, but has met with encouraging success.

A new company, known as the Butler Company, has been organized at Butler, Ind., which will succeed the Butler Mfg. Company and will operate the wind mill and bicycle plants on a large scale.

The Field Force Pump Company, Lockport, N. Y., are about to build a large addition to their plant.

The Dillon-Griswold Wire Company, Sterling, Ill., have certified to a decrease of capital stock to \$15,000.

Miscellaneous.

The contract for a new bridge over the Connecticut River at Hartford, Conn., has been awarded to the Berlin Iron Bridge Company of East Berlin, Conn., at their bid of \$274,900. Bids were asked for on three different styles of structures, and were received from the following concerns:

Companies.	Pratt truss.	Camel back.	Parabolic.
Berlin Iron Bridge Company.....	\$274,900	\$293,840	\$301,500
Dean & Westbrook.....	280,900	298,300	308,200
R. F. Hawkins.....	284,200	296,100	305,700
Phoenix Bridge Company.....	290,500	302,890	312,000
Boston Bridge Works.....	288,350	295,000	304,300

At a recent meeting of the stockholders of the Berger Mfg. Company, Canton, Ohio, manufacturers of sheet metal roofing, siding and ceiling, the capital stock of the concern was increased from \$100,000 to \$250,000.

The new car shops at Dunkirk, Ind., are now under construction, the plans and specifications having been completed. The buildings will be principally of brick, one story, with 18-foot side walls. They will comprise a boiler and forge shop, 70 by 83; power house, 26 by 47; wood mill, 60 by 150; paint and oil store house, 28 by 35; paint shop, 83 by 90; passenger car repair shop, 83 by 154; storeroom, 19 by 46; machine shop, 83 by 199; office, 16 by 37. Three frame buildings will be erected for freight repair shops.

The Bessemer and blast furnace departments of the new plant now being erected at Monroe, Conn., by the Fairfield Copper Company, will be in operation by December 1. The officers of the company are as follows: President, George Lowther; vice-president, L. J. Merkel; treasurer, Edward L. Smith; secretary, Henry J. Uderitz; superintendent of construction, F. M. Smith, and superintendent of works, Victor Ray. The company have a New York office at 45-47 Wall street.

The Cameron Brass Works of Valparaiso, Ind., have received an order from a Chicago firm for 25,000 well valves and will at once double their working force.

The Iron and Metal Trades.

The most sensational report of the week is that relating to the placing of an order for three armored cruisers by the Russian Government. The reports, which are as yet unconfirmed, have it that the Cramps have captured the work and that the Bethlehem Iron Company have secured the order for the armor. That both shipbuilders and armor plate makers have had negotiations of this character under way is beyond any doubt. The reported success of the negotiations is certainly a flattering tribute to the ability of our yards and shops, and proves their capacity to compete with the Europeans in this particular line of work.

Somewhat extravagant stories have been set afloat about the 10,000-ton Cast Pipe order for the Tokio Water Works. The matter is still in abeyance. The first order for 10,000 tons of heavy Pipe for these works was taken by the Scotch founders at \$20, f.o.b. Glasgow, with a 30 shilling freight rate, which American shops could certainly beat in spite of somewhat higher rates of freight.

The prospects for work for the future are becoming more and more favorable. Bids are in for a four-track railroad bridge for this city, which will call for 35,000 tons of material, including the approaches. The work will extend over two years. Then there is the certainty that the coming years will witness a very large outlay of money for rapid transit in New York, with its large requirements of Iron and Steel.

The building of large structures, too, promises to absorb a very large amount of Structural Material in all the larger cities in the country, and in many of the smaller towns. Quite a number of buildings have been closed in New York, including the extension of the Waldorf Hotel, which puts 8000 tons into the shops of a Pittsburgh mill. Outside of that a few thousand tons have been taken in New York.

Still, the better prospects refer rather to the more distant future, and have less to do with the perplexing problem relating to the turn of affairs for the next three or four months.

Bessemer has got down to \$10.40 in Pittsburgh. From Cincinnati comes the report of three transactions of 25,000 tons each, for delivery during the first six months of 1895. The Valley furnaces are alluded to as the sellers.

Rumors of \$15 Billets in the Pittsburgh market are numerous, but cannot be verified. However, \$15.25 has been done for lots of a few hundred tons. Chicago records quite heavy sales of Billets and Rods. In the Central West the latter have got down to \$22 at seller's mill.

There have been no new developments in the Steel Rail trade, but something definite is expected soon.

In Foundry Irons sales are moderate and the market for the Southern product has displayed unmistakably a weakening tendency.

Philadelphia.

Office of *The Iron Age*, 220 South Fourth St., PHILADELPHIA, Pa., November 20, 1894.

The market has developed no new features since date of our last report, and from present appearances things are likely to continue without much change to the end of the year. The volume of business is considerable in the aggregate, a few report great activity, but the majority are doing not much more than half or two-thirds of what they would like to do, and what they are able to do if they had the opportunity. Prices during the week have held fairly steady, but there is a probability that desirable orders could be placed on somewhat better terms than are usually quoted, providing the right kind of an offer was made. Large buyers have provided for their requirements to the end of 1894, however, some for two or three months beyond that, so that there is not much probability of improvement until after the turn of the year.

Pig Iron.—Sellers consider that the market is in quite as good shape as they ought to expect in view of the lateness of the season and the steady increase in the output. There is no change in prices, although as usual some find it easier to make sales, while others affirm that they lose trade at quoted rates. These discrepancies of statement are frequently met with, however, but the real truth in regard to the market is that it averages steady as regards prices and fairly active as regards demand. In this vicinity no sales can be verified at less than quoted rates, while quite a number of sellers decline to go far into the year at the full figures quoted for November and December shipments. Taking everything into account, therefore, it may be assumed that the market is not weak, and while it may lapse into temporary dullness, owing to the near approach of the holidays, the ultimate outlook is in favor of better prices than are now ruling. Bessemer Iron is weaker, but at present there is not much demand for that grade of Iron. General quotations for Philadelphia and nearby points are about as follows, and from 20¢ to 30¢ less 50 to 100 miles South or West:

Bessemer.....	\$12.50 @ \$12.75
Standard No. 1 Foundry X.....	12.50 @ 13.00
Standard No. 2 Foundry X.....	11.50 @ 11.75
No. 2 Plain.....	10.75 @ 11.00
No. 1 Soft.....	11.50 @ 11.75
No. 2 Soft.....	10.75 @ 11.00
Standard Gray Forge.....	10.50 @ 10.75
Ordinary.....	@ 10.25

Muck Bars.—Nothing doing. Prices are nominally \$18 @ \$18.50 at mill, but no sales are reported.

Steel Billets.—The market is easy at \$17.80 @ \$18.00 delivered, and a fair business is being done at these figures. The weakness in Bessemer favors buyers of Billets, and while there is not much chance of better prices this year, it is hardly possible that there can be any decline. Sellers offer quite liberally, however, and there is just a possibility that offers for good deliveries from first-class buyers might be done at better figures than have yet been quoted.

Finished Material.—The demand for small and medium sized lots has been quite active, but the aggregate is not much, if any, in excess of the week's deliveries. Some mills have added to the work in hand, others have lost, but it is hardly to be expected

that there will be any important additions until toward spring. All departments are doing something. Skelp and Boiler Plates being probably in better demand than any other class of Finished Material, but prices are extremely low and give but little promise of improvement in the near future. Prospects for work during the coming year are extremely promising, but in the mean while mills are all skirmishing for something to tide them over until then, hence weakness in prices, which for small lots are nominally as follows:

Grooved Skelp.....	1.22½¢ @ 1.25¢
Standard Refined Bars.....	1.20¢ @ 1.25¢
Medium quality.....	1.10¢ @ 1.15¢
Tank Steel.....	1.30¢ @ 1.35¢
Heavy Plates.....	1.30¢ @ 1.40¢
Shell.....	1.50¢ @ 1.60¢
Flange.....	1.60¢ @ 1.80¢
Angles.....	1.40¢ @ 1.50¢
Beams and Channels.....	1.50¢ @ 1.60¢

Old Material.—Good demand, but it has been found impossible to secure any advance in prices as yet. The low price of Finished Material, as well as the low price for Pig, seems to be an effectual barrier to higher prices for Scrap, although the demand is good and stocks decreasing. General asking prices about as follows, delivered:

Heavy Melting Steel.....	\$10.00 @ \$11.00
Light Melting Steel.....	8.00 @ 8.50
No. 1 Wrought Scrap.....	11.00 @ 11.50
Machinery Cast.....	9.00 @ 10.00
Wrought Turnings.....	8.00 @ 8.50
Cast Borings.....	6.00 @ 6.50
Old Iron Rails.....	12.00 @ 12.50
Old Car Wheels.....	10.00 @ 10.25
Old Iron Axles.....	15.50 @ 16.50

William B. Ogram, who was for two years traveling sales agent and who was for three years in charge of the Philadelphia office of the Pottsville Iron & Steel Company, has been appointed sales agent for Philadelphia and vicinity of the Reading Rolling Mill Company, manufacturers of Structural Shapes. His office will be at 257 South Fourth street.

Chicago.

(By Telegraph.)

Office of *The Iron Age*, 59 Dearborn street, CHICAGO, November 21, 1894.

The situation this week is unsettled. The future is projecting itself into the present with considerable strength in some lines, and the outlook is excellent for large business next year. But in other directions the demand has fallen off and competition is increasing among sellers. The general tendency is, nevertheless, in the direction of an expansion of business. Prices show very little improvement, and in some cases values have actually receded.

Pig Iron.—The time is now at hand when buyers are generally doing very little in making new contracts, as the close of the year is approaching and stocks are permitted to run low. Yet an occasional consumer is found, the nature of whose business requires him to purchase material without regard to the inventory season. Enough business of this spasmodic character has been placed since last report to make a fair trade. Orders for 200 to 300 tons have been frequent and several 1000-ton lots were sold. These transactions have almost invariably fallen into the hands of the local Coke Iron makers. Southern sellers have done but little, although offering concessions. The demand for Lake Superior Charcoal is fair but by no means large, the demand running only to small lots, with prices

drooping. Quotations are given as follows for cash:

Lake Superior Charcoal.....	\$12.00	@	\$13.50
Local Coke Foundry, No. 1.....	10.12½	@	10.25
Local Coke Foundry, No. 2.....	9.50	@	9.75
Local Coke Foundry No. 3.....	9.25	@	9.50
Local Scotch.....	10.25	@	11.00
Ohio Strong Softeners No. 1.....	12.50	@	13.70
Southern Silvery, No. 1.....	11.50	@	11.75
Southern Silvery, No. 2.....	11.25	@	11.50
Southern Coke, No. 2.....	10.25	@	10.50
Southern Coke, No. 3.....	9.75	@	10.25
Southern, No. 1 Soft.....	10.25	@	10.50
Southern, No. 2 Soft.....	10.00	@	10.25
Alabama Car Wheel.....	17.50	@	18.00
Jackson County Silvery.....	15.50	@	16.00
Other Ohio Silvery.....	14.25	@	14.50
Coke Bessemer.....	11.00	@	11.25
Coke Malleable.....	11.00	@	11.25
Spiegeleisen 20 %.....	...	@	26.00

Bars.—The condition of the Bar Iron trade is decidedly better. More orders have been placed within the past week than for the preceding month or more. Inquiries are out for a number of round lots for deliveries running through the greater part of next year. Agricultural works whose contracts have not been placed are now coming in with inquiries for their requirements during the next six months. Car business is looking up to some extent. The Mexican Central Railroad have purchased 225 box cars from a car works not far from this city. It is rumored that a large road will shortly place an order for 200 cars. The tone of the trade has perceptibly changed, and the market now seems to be steadier at slightly better figures, say 1.05¢ @ 1.10¢, Chicago, for mill shipments of Common Iron. Guaranteed Iron is unchanged at 1.15¢ @ 1.20¢. Soft Steel Bars from strictly Billet stock are quoted at 1.15¢ @ 1.25¢, Chicago, on mill shipments. Jobbers continue to quote small lots at 1.15¢ upward for Iron, and 1.30¢ upward for Soft Steel.

Structural Material.—The local yards continue to receive small orders for Building Shapes which keep them remarkably busy for this time of the year, with the country building season so nearly over. Bridge works are buying small quantities of material steadily. Building projects of more or less importance are now coming up and it appears to be likely that several deferred office buildings will be undertaken the coming spring. Quotations for mill shipments, Chicago delivery, are as follows: Beams and Channels, 1.50¢; Angles, 1.40¢ @ 1.45¢; Tees, 1.65¢; Universal Plates, 1.40¢ @ 1.45¢. Small lots of Beams and Channels from stock, 1.50¢ @ 1.55¢; Angles, 1.50¢ @ 1.60¢; Tees, 1.70¢ @ 1.80¢.

Plates.—Orders originating in this market were fully as numerous and large as any week during the fall, but mills appear to be hungry for orders and prices have gone considerably lower than heretofore noted. The mills appear to be making very little distinction as to the size of the order or terms of payment in giving the benefit of their low prices to purchasers. Under the circumstances our quotations are nominal, it being an easy matter to shade them. We continue prices on mill shipments, Chicago delivery, as follows: Tank Steel, 1.40¢ @ 1.50¢; Flange Steel, 1.65¢ @ 2.10¢; Fire Box, 1.65¢ @ 5¢. Store prices are as follows: Iron or Steel Sheets, Nos. 10 to 14, 1.70¢ @ 1.80¢; Tank Steel, 1.50¢ @ 1.65¢; Flange Steel, 2¢ @ 2.15¢; Boiler Tubes, in carloads, 75 % off.

Sheets.—The market for Black and Galvanized Sheets has not improved, but here and there a manufacturers' agent can be found who has special reason for taking a hopeful view of the future. So many mills, however, are running short of work that they are quite anxious for business and make

prices slightly lower than previously ruling, especially for future delivery. Mill shipments are quoted at 2.30¢ @ 2.35¢, Chicago, for No. 27 Common for early delivery, 2.40¢ @ 2.45¢ for Steel Sheets and 80 % off for Galvanized Sheets. Sheet Copper is unchanged at 14¢ base. Small lots of No. 27 Common Sheets are sold by jobbers at 2.40¢ @ 2.50¢, and Galvanized Sheets 75 and 10 % off.

Merchant Steel.—Manufacturers' agents report a considerably larger trade. Small consumers and Agricultural manufacturers who have not yet bought are evidently believing that this is a good time to cover their requirements for the next few months and both sales and inquiries are therefore good. Mill shipments, Chicago delivery, are quoted as follows: Smooth Finished Machinery Steel, 1.50¢ @ 1.60¢; Smooth Finished Tire, 1.50¢ @ 1.60¢; Open Hearth Spring Steel, 1.75¢ @ 1.80¢; Ordinary Tool Steel, 5½¢ @ 7¢; Specials, 10½¢ and upward.

Billets and Rods.—A very active inquiry exists for Billets and Rods for delivery next year. Sales of considerable quantities of both have been made, extending over the first three months. Inquiries in some cases cover the entire 12 months, but manufacturers are not yet making quotations so far ahead. Indications now are that the local mills will be crowded with work to their utmost capacity for the remainder of the winter at least. Consumers appear to be perfectly willing to pay prices recently ruling, but it is extremely difficult to obtain an advance. Quotations are therefore continued at \$17 on Billets and \$23.50 on Wire Rods.

Rails and Track Supplies.—Inquiries for small lots of standard Rails are still being received by the local makers, but they are not numerous, and the termination of the present season is rapidly nearing. The local mill will be able to run until well into December, with orders still on hand. Quotations are continued as follows: Standard Rails, \$25 @ \$27; Steel Splice Bars, 1.30¢ @ 1.35¢; Track Bolts, with Hexagon Nuts, 1.90¢ @ 2¢; Spikes, 1.60¢ @ 1.70¢; Links and Pins, 1.60¢ @ 1.70¢.

Old Rails and Car Wheels.—A sale of Old Iron Rails is reported at a trifle under \$11, but dealers are of the opinion that the market ranges from \$10.75 to \$11.25, according to quantity and terms of sale. Short pieces of Old Steel Rails are somewhat weaker and are now quoted at \$7 @ \$7.50. Long lengths are quoted at \$8.50 @ \$9. Old Car Wheels are unchanged at \$9 @ \$9.50.

Scrap.—Some large transactions have been made in Forge Scrap by railroads which have sold direct to consumers. The demand from dealers is fair but not large. Inquiries during the past week have been comparatively light. Dealers quote the following selling prices per net ton: Railroad Forge, \$8.50; Dealers' Forge, \$8; No. 1 Mill, \$7; Pipes and Flues, \$7; Axles, \$12.75; Heavy Cast, \$7.50 @ \$7.75; Stove Plates, \$5.50 @ \$6; Cast Borings, \$3.50; Wrought Turnings, \$5.50; Axle Turnings, \$6.25; Fish Plates, \$9.50; Horseshoes, \$9.25; Mixed Steel, gross ton, \$6; Heavy Melting Steel Scrap, \$7 @ \$7.50.

Metals.—Lake Copper is a trifle stronger in anticipation of the close of navigation, but carload lots can be had at 10¢ during this week. Casting Copper is very dull, but still quoted at 9.50¢. Spelter is unchanged at 3.20¢

@ 3.22½¢. Sales have been made at these rates running over the next two or three months. Pig Lead holds its own, being firm at 2.97½¢ @ 3¢. About 300 tons were sold during the past week. Buyers are bidding 5¢ less for futures.

Pittsburgh.

Office of The Iron Age, Hamilton Building, Pittsburgh, November 20, 1894.

The situation in the Iron and Steel trade, as printed in our review of last week, is without material change. There is a fair volume of business for delivery up to the first of the year, but little or nothing is being done for next year. With the demand only moderate and most of the sellers anxious for business, the natural result has been that prices on some lines, particularly Bessemer Pig and Billets, are lower. It is believed that trade will be quiet for the balance of this year, but there is a hopeful feeling for next year, and the trade generally looks for business to commence to pick up in January, and by March or April there should be a very perceptible increase in orders. Considerable speculation is being indulged in as to whether the Rail mills will come to an understanding for 1895 or whether the field will be an open one. With the Ohio Steel Company coming into the market early in the year, and the Colorado and the two Eastern mills to be taken care of, the situation is much more difficult of solution than it has ever been before. Andrew Carnegie has been in Pittsburgh for about a week and is expected to remain for some days yet. As usual, there are all sorts of rumors going as to important changes to be made among officials of the Carnegie interests, but as yet nothing official has been given out.

Pig Iron—With considerably more Bessemer Pig being made than is being called for, there is more pressure on the part of furnaces to effect sales and prices are lower. There has been very little call for Pig Iron from the Steel mills for some time past, and the prospects for any improved demand from this class of buyers in the near future are not encouraging. While it is true that Bessemer Pig can be bought considerably cheaper to day than it could a month ago, at the same time Steel is also cheaper, so that the Steel maker is no better off than he was before. When the Ohio Steel Company start up they are expected to use from 800 to 1000 tons of Pig per day, and while this will take care of the product of some four or five of the Valley furnaces, it can hardly be expected to improve the situation very much, as their product will be sold to customers formerly supplied by Pittsburgh and other districts. The demand for Gray Forge Iron is light, but the supply is limited by reason of nearly all the furnaces being on Bessemer. Prices are somewhat lower and \$9 at Valley furnace has been shaded. In Foundry Irons the situation is unchanged. We quote as follows:

Neutral Gray Forge.....	\$9.50	@	\$9.65, Cash.
All-Ore Mill.....	9.65	@	9.75
No. 1 Foundry.....	11.65	@	11.75
No. 2 Foundry.....	10.75	@	11.00
Bessemer.....	10.40	@	10.50

We note a sale of 1500 tons of Bessemer at \$10.50, Pittsburgh, and one of 500 tons of Gray Forge at \$9.50, Pittsburgh.

Billets.—Some inquiries are in the market for Steel for December delivery, but nothing is doing for delivery next year. The Steel mills are all anxiously awaiting the outcome of the situation

in the Rail trade. Should the agreement not be renewed, and a more active demand for Rails ensue by reason of lower prices, it is believed that the Steel market would be materially benefited. The mills seem more anxious for business, and while prices are a shade weaker, no material decline has occurred. Billets for December delivery may be quoted at \$15.40 @ \$15.50 at maker's mill. Some mills decline to sell below the second named figure. We note sales as follows: 1500 tons at \$15.40, 1000 tons at \$15.45, 500 tons at \$15.45 and 300 tons at \$15.50, all at maker's mill and for December delivery.

Ferromanganese.—The local maker has reduced prices \$1 $\frac{1}{2}$ ton, and we now quote 80 % domestic at \$49 $\frac{1}{2}$ ton, delivered at buyer's mill. The foreign article has been offered here at \$49.25, and it is probable this price could be slightly shaded.

Plates.—An inquiry is in the market for 1200 tons of Ship Plates for Cleveland delivery, but the order has not yet been placed. There is a moderate demand going, and one or two concerns, who have their order books in pretty comfortable shape, are very firm in their views as to prices, and are refusing to meet the lower quotations in the market. We quote as follows: Tank Steel, 1.15¢ @ 1.25¢, according to order; Flange, 1.35¢ @ 1.40¢; Shell, 1.30¢ @ 1.35¢.

Structural Material.—As previously noted the demand has fallen off to some extent and mills are guaranteeing quick deliveries when necessary to secure the order. We quote as follows: Beams and Channels to 15-inch, in round lots, 1.20¢. For medium sized orders 1.25¢ @ 1.30¢ is being obtained. We quote Angles and Universal Plates, 1.15¢ @ 1.20¢; Tees, 1.35¢ @ \$1.40¢.

Muck Bars.—We make nominal quotation of \$18.75, delivered at buyer's mill, for best grades.

Bars.—We can report an improved demand, and while prices are not actually higher they are firmer in tone, and some mills are refusing to meet prices that they possibly would have accepted a month ago. We continue to quote Common Iron Bars at 0.95¢ @ 1¢ and Steel Bars at 1¢ @ 1.05¢, with the usual half extras.

Merchant Steel.—The volume of business shows improvement and prices are perhaps a shade firmer. We quote as follows: Bessemer Machinery, 1.15¢ @ 1.25¢; Open Hearth Spring, 1.50¢ @ 1.60¢; Open Hearth Machinery, 1.40¢ @ 1.50¢; Machine Straightened Tire, 1.50¢ @ 1.60¢; Sleigh Shoe, 1.50¢ @ 1.60¢; Toe Calk, 1.70¢ @ 1.75¢.

Sheets.—The demand for Black Sheets is fairly active and most of the mills are in comfortable shape for the balance of the year. Galvanized Sheets are in only moderate demand, and prices are a trifle weaker. We quote No. 27 Common Iron Sheets at 2.20¢ @ 2.25¢, and No. 27 Steel at 2.30¢ @ 2.35¢. Galvanized Sheets are ruling at 80 % off for good sized orders.

Wire Rods.—There have been no large buyers in the market for some time. Sales of 100 and 200 ton lots are being made on the basis of \$22.25, Pittsburgh.

Wire and Cut Nails.—The demand for Wire Nails is fair, but prices are somewhat demoralized. It is evident that the efforts of the Wire Nail makers to control the situation, as regards prices, have not been as successful as desired. Competition at this time is

very severe and Wire Nails in carload lots are easily obtainable at 95¢ at mill for usual averages. For round lots this price is being slightly shaded. Cut Nails are in fair demand and are ruling at 85¢ for usual averages. For attractive orders this price would be shaded.

Barb Wire.—The demand for Barb Wire for delivery this and next month is light and prices are a shade lower, doubtless due to the reported disruption of the Barb Wire pool. We quote Four-Point Galvanized at \$1.90 @ \$2 in carload lots. Plain Wire is ruling at \$1.20 @ \$1.25 in carload lots.

Pipes and Tubes.—The situation is unchanged from that noted last week. The American Tube & Iron Company have received a second order from the Midland Steel Company of Muncie, Ind., for several miles of 8-inch Line Pipe.

Skelp Iron and Steel.—We quote as follows: Grooved Steel Skelp, 1¢ @ 1.10¢, according to width and order; Sheared Steel Skelp, 1.15¢ @ 1.20¢; Grooved Iron Skelp, 1.20¢ @ 1.25¢; Sheared Iron Skelp, 1.30¢ @ 1.35¢.

Connellsville Coke.—For the week ending November 10 there were 13,921 ovens in the Connellsville region in blast and 3653 idle, the production for the week in question being estimated at 139,189 tons. Compared with the production of the previous week this was a decrease of 399 tons. We continue to quote Furnace Coke at 90¢ @ \$1 and Foundry Coke at \$1.15 to consumers in tons of 2000 pounds.

Louisville.

LOUISVILLE, KY., November 19, 1894.

Pig Iron.—While we cannot register any higher prices than have ruled for some weeks, yet there is such a buoyancy, more perhaps, in anticipation than in actual transactions, that the furnaces feel that they are the true masters of the situation. Some of the largest producers have refused to shade present prices at all for tempting orders, and all agree in refusing to book contracts for delivery beyond the present year. As the consumers made the rule of a hand-to-mouth policy, the furnaces demand continuance until they feel justified in reaching out for a year's run. Last week's figures are quoted for the present:

No. 1 Foundry, Southern	
Coke.....	\$9.75 @ \$10.75
No. 2 Foundry, Southern	
Coke.....	9.00 @ 9.50
No. 3 Foundry, Southern	
Coke.....	8.50 @ 9.00
Gray Forge.....	8.25 @ 8.75
Mottled.....	8.00 @ 8.50
No. 2, Soft.....	8.75 @ 9.25
Southern Car Wheel Iron.....	15.50 @ 17.00

There is some demand for Old Material, such as Wheels at \$10, and Iron Rails at \$11. Local mills and foundries take up about all the Wrought and Cast Scrap that comes to this market.

While the furnacemen in the South are getting up a good feeling, the manufacturers of certain products made from Bessemer Steel are as demoralized as the Bessemer furnaces themselves, and are cutting and slashing at each other, and getting prices down to where there is no profit to themselves and very little advantage to the jobbers. Wire Nails and Barb Wire are the leading articles in this line at present. Hardly a week passes without noting a decline. Lower prices tempt some dealers to load up, but actual consumption cannot be forced at this time of the year.

There is plenty of money in the trade which would readily be put into heavy stocks if the jobbers believed there was any sure money in it, but at this time there is no element of speculation in sight, dealers buying only what they expect to readily dispose of. Some dealers predict a continued decline in such staples as above and Bar Iron for the next 60 days, and it will take a very firm stand, based on faith of some sort, that will stem the downward course of affairs. This pessimistic prediction pertains only to the next 60 days of naturally quiet time; after that the usual spring trade will come in due course of time, and even the bluest croaker admits that a good year will be inaugurated.

Advices from several of the largest mills supplying Louisville trade with Bar Iron agree that an advance will certainly be made in prices by or before January 1, and that the demand will be very much heavier. Consumption in agricultural, wagon and car works is abnormally small, and a slight stimulus will cause natural demand and at better prices. The mills are running on moderate time, but none of them are accumulating stocks, neither are the jobbers afflicting themselves with an overburden. Such a condition of affairs is influencing the furnaces to demand a slight advance on Pig, which would be hailed as a good omen by the mill men, who in turn could easily obtain it from consumers.

Cincinnati.

(By Telegraph.)

Office of The Iron Age, Fifth and Main Sts., CINCINNATI, November 21, 1894.

The element of speculation has become a factor of importance in the market for Pig Iron during the past week, but the heavy purchases have been confined to Bessemer Pig. Cincinnati has been only indirectly instrumental in effecting a sale of 25,000 tons of Bessemer Iron for six months delivery, but it is reported that two other lots of equal amounts for delivery extending over the same period of time have also been sold by Mahoning and Shenango Valley stacks. A review of the market for Southern Pig discovers an element of strength which heretofore has not been fully recognized even by the dealers themselves. The general buyer of Pig Metal apparently believes, and it is surely the sentiment of the general public, that the Southern furnaces have a large reserve capacity which will yield a liberal supply of iron the moment the stimulus of increased purchases is applied to the market. While of course there are now idle a number of stacks in the South which could produce Iron if thrown into active service, the fact remains that the majority of the idle furnaces are either entirely dismantled or in such poor repair that before they could be regarded as a factor in the market from six months to a year must elapse and a considerable amount of money be consumed. Aside from the sales of Bessemer Pig there has been some increase in the demand from consumers. Pipe works have been the largest buyers, with single transactions of 2000 tons each for 60 to 90 days' delivery, but the majority of business is formed by numerous small sales of no special significance in themselves, but quite considerable in the aggregate. Furnaces in the South already have a number of orders for delivery up to the first of the

year and the smaller stacks are not disposed to accept or at least solicit any but very small orders for delivery after the New Year, except at an advance in price. The larger furnaces, too, are decidedly firm, refusing orders which are even 5¢ per ton under the current market rates. While there is no marked increase in activity among the leading industries consuming Iron there is evidence of a more confident tone. Taking all facts into consideration the market appears to be in a transitory stage with the prospect favorable for larger sales at higher prices after the first of the year. Quotations are as follows:

Foundry.

Southern Coke, No. 1.....	\$10.00 @	\$10.25
Southern Coke, No. 2.....	9.25 @	9.00
Southern Coke, No. 3.....	8.75 @	9.00
Ohio Soft Stone Coal, No. 1....	14.50 @	15.00
Ohio Soft Stone Coal, No. 2....	14.00 @	14.50
Lake Superior Coke, No. 1.....	12.00 @	12.50
Lake Superior Coke, No. 2.....	11.00 @	11.50
Hanging Rock Charcoal, No. 1..	16.00 @	16.50
Hanging Rock Charcoal, No. 2..	15.50 @	16.00
Tennessee Charcoal, No. 1.....	13.00 @	13.50
Tennessee Charcoal, No. 2.....	12.00 @	12.50
Bessemer.....	11.95 @	12.00

Car Wheel and Malleable Irons.

Standard Southern Car Wheel	15.75 @	16.75
Lake Superior Car Wheel and Malleable.....	14.25 @	14.75

Forge.

Gray Forge.....	8.50 @	8.75
Mottled Coke.....	8.25 @	8.50

St. Louis.

(By Telegraph.)

Office of The Iron Age,
Bank of Commerce Building,
St. Louis, November 21, 1894.

Pig Iron.—The market is dull, and with no prospect of immediate improvement. There is an almost entire absence of inquiry, and the sales made are limited in quantity. A favorable feature of the market is the determined stand taken by the furnacemen, in refusing to shade prices. They argue that at this season of the year nothing will induce buyers to anticipate their wants, and if prices were cut 50¢ a ton the volume of business would fail to show any increase. Under these circumstances a steady adherence to prices can be depended upon for the balance of the year. We quote as follows for cash, f.o.b. cars St. Louis:

Southern Coke, No. 1 Foundry.....	\$10.75 @	\$11.00
Southern Coke, No. 2 Foundry.....	9.75 @	10.00
Southern Coke, No. 3 Foundry.....	9.50 @	9.75
Southern Car Wheel.....	16.50 @	17.00
Gray Forge.....	9.00 @	9.25
Ohio Softeners.....	14.00 @	14.50

Bar Iron.—The demand is somewhat heavier, and 1.05¢ is the ruling price new quoted for lots from mill. Jobbers report a better inquiry, and the market looks brighter all around. Jobbers quote 1.10¢ @ 1.15¢, according to quantity.

Barb Wire.—The market is unsettled. It is pretty well assured that there is no possibility of an agreement being arrived at to restrict producers, so that every mill in the country can now make as much Wire as they care to. This is unfortunate, as the agreement which was in existence up to October 1 of this year was of material assistance in maintaining a fair average price. Under the changed conditions lower prices seem certain to prevail. We quote in carload lots, Painted, \$1.65; Galvanized, \$2.05. Less than carloads command \$1.75 for Painted, and \$2.15 for Galvanized.

Wire Nails.—When the deal was made with the Baackes Wire Nail Company several weeks since, it was thought the competition emanating from that source was disposed of, but recent events seem to have proven this a mistaken idea, and as a result some low prices are now prevailing. Jobbers quote \$1.10 @ \$1.15.

Rails and Track Supplies.—Extreme quietness prevails in this department and there is absolutely nothing doing in Steel Rails, even in the lighter sections. Track Supplies are quoted as follows: Splice Bars, 1.10¢ @ 1.15¢; Spikes, 1.55¢ @ 1.60¢; Bolts, Square, 1.80¢; with Hexagon Nuts, 1.90¢; Steel Links and Pins, 1.50¢; Iron, 1.60¢; Steel Rails are nominally \$26.50 @ \$27; Old Iron Rails are plentiful at \$10.50 @ \$11.

Pig Lead.—Several carload lots of Pig Lead are reported at 3.12½¢ with sellers holding out for 3.15¢. The demand is not heavy, however, and any radical change in prices is not anticipated.

Spelter.—This metal is a trifle weaker and 3.15¢ is now the ruling price. The demand is fairly satisfactory, but not sufficiently large to influence the price.

Birmingham.

BIRMINGHAM, ALA., November 19, 1894.

An unmistakable feeling of discouragement appears to pervade this district. The slight reaction immediately after the elections has given place to a downward tendency in nearly all lines. That this is probably due to the natural cause of approaching the end of the year does not interfere with its being a noticeable and regrettable fact. There is no improvement shown in the market at all, in some cases it is reported quiet, though fairly steady, in others it is reported as positively downward in prices as well as sales. This is especially the case with the rolling mills. In no case is any expectation shown that conditions will improve this year. It is not probable that sales thus far made into next year will cut a heavy figure, as they are comparatively few, most selling having been done in small orders and short time. There is therefore no danger that this factor will enter seriously next year if general conditions will improve. The most serious phase in this district is the scarcity of cars. Furnaces, mills, mines and quarries are alike suffering for lack of cars. The railroads seem powerless, in spite of miles of tracks filled with defective cars, to remedy the evil. This is serious in so far as it actually holds back the development of the district in restricting the outputs all around for lack of rolling material. There seems no immediate remedy for this nor can it be seen that any determined effort is being made by the roads to overcome the difficulty. Such effort would have an immediate effect on the market in making the roads a customer of the mills, aside from relieving the congested condition of affairs.

Pig Iron.—Sales in this branch are very fair, but prices are decidedly downward, though this is denied in some quarters. Sales are reported as about equaling production again. Few large orders are reported, though several of 5000 and 2500 tons are on record. The majority of sales are for carload to 500-ton lots. Sales are very generally distributed, Chicago reporting some 1500 ton lots and a number of smaller or-

ders at ruling prices. One large producer has booked in the first 16 days of this month orders for 34,000 tons for its Alabama furnaces. The lower grades and No. 2 Soft are in best demand, while one firm report being pushed to supply their Foundry orders. A favorable sign of the market is that there is no cancellation or delaying of orders reported, customers are so close up that they must have what they do order right along. Stocks have accumulated, though reports indicate that shipments are again equaling make. No. 1 Furnace, at Bessemer, belonging to Tennessee Coal, Iron & Railroad Company, was blown in last week.

Finished Material.—Decided discouragement is all that can be reported. Stocks are increasing, and while demand is fair, prices are such that many offers are refused. The Pittsburgh mills are reported as dumping their surplus into the Southern territory at any price, and hence making the market hesitating and uncertain. Negotiations are still continuing between the Jefferson Steel Company and the Birmingham Rolling Mill, looking to a resumption of the former plant and the shipment of its product to the latter. No definite result is expected until prices settle to a firmer basis.

The Japanese Pipe order, reported in various papers as having been captured in Alabama, is still in *statu quo* apparently. The negotiations are some six or eight months old and probably little will come of it at the end.

The United States cruiser "Montgomery" is now testing the Alabama Coals, and representatives of the Coal companies are watching results with the greatest interest.

Financial.

Bids for the new Government bonds have been received in unusually large numbers at the Treasury, and the general public appears to be taking a good deal more interest in the forthcoming issue than was the case with that in February last. Considerable disappointment is, however, felt in that heavy drafts of gold coin have been made on the Sub-Treasury by would be purchasers of the new bonds. Up to Tuesday evening these withdrawals amounted to \$4,650,000, and there is reason to fear that an equal amount of gold may be withdrawn before the opening of the bids on Saturday, in which case the first payment of \$10,000,000 on the \$50,000,000 bond issue will be almost entirely swallowed up by the drafts on the gold reserve of the Treasury. The Treasury gold balance, which stood at \$62,000,000 a week ago, is already down to \$57,500,000, and further large drafts would almost wholly offset the gain from payments for the bonds and defeat the object of the present issue.

The attitude of the banks in the matter seems to be uncertain; but it is generally understood that about \$30,000,000 of gold will be furnished by the banks of this city; and, as to the remainder, the Treasury officials will be left to make their own arrangements. The statement that the whole issue would be subscribed for *en bloc* by a syndicate of the banks has been denied, but there is little doubt that the bonds will be taken easily, and will probably be largely oversubscribed. It is thought probable that a goodly proportion of the bonds will be taken abroad.

The bond issue has had no lasting effect on the market for securities, prices of stocks having receded materially during the week under review, and bonds being lower and irregular. Nor has the improved feeling in the loan market, referred to last week, been maintained. Speculation is again flat and operations confined largely to the professional trade element. Meanwhile, general business throughout the country is reported as showing some improvement, and the progress toward recovery goes on slowly and gradually. There has been an advance, too, in the prices of some staple commodities; and bank clearings last week showed an increase—albeit slight—over those of last year.

The interest of the financial world will soon center in the coming message of President Cleveland, which is expected to be devoted largely to the currency question. It is urgently demanded in business circles that this problem be taken in hand by Congress and something definite be done toward a settlement and harmonizing of the present monetary laws in the interests of the business of the country.

On the Stock Exchange the market has relapsed into a condition of weakness during the past week, and prices generally show a sharp decline. Almost all the active speculation has been in Sugar stocks, transactions on these securities comprising about one-third of the total dealings. The movements of Sugar, up and down, have, however, little or no significance, the stock being used as a purely gambling medium. The granger issues generally have experienced a sharp decline. St. Paul's returns of gross earnings in the second week of November, issued on Friday, showing a decrease of over \$194,000, caused a bad impression, and resulted in a sharp break in that stock, which was emphasized by heavy London selling. All the granger roads followed suit, and the weakness spread to the entire railroad list. The new Southern railroad securities fell among others. Much interest is felt in the course of the directors of the Burlington road in regard to their dividend, which will be announced in a day or two. Uncertainty as to their action keeps the market in a waiting attitude. The unsettled condition of the coal trade has also demoralized the stocks of the railroad companies directly interested. Generally the stock market is narrow and feverish, with an unsettled feeling.

Railroad and miscellaneous bonds have been somewhat less active, and the list generally shows a decline in prices. Government bonds have remained fairly steady, closing on Wednesday as follows:

	Bid.	Asked.
2's, 1891, regular.....	96	96
4's, regular.....	114	115
4's, coupon.....	114	115
5's, regular.....	117½	118½
5's, coupon.....	117¾	118¾

London selling of St. Paul and other granger issues on Monday and Tuesday, together with an advance in discount rates at that center, caused a stiffening in sterling exchange which precludes the expectation of any heavy influx of gold at present. Great interest was felt in the engagement of \$1,000,000 gold in London on Friday for shipment to this city, as the current rates of exchange did not at the time appear to warrant such a transaction. The shipment, however, was said to be made for special purposes and the exchanges were not affected by it. Actual business was done on Wednesday at \$4.86½ @ \$4.86½ for 60 days, \$4.87½ for demand, \$4.87½ for cables and \$4.84½ for commercial.

The loan market continues dull and easy. Money on call remains unchanged at 1%. Time loans are still offered largely in excess of borrowers' requirements, but bankers are still indisposed to conclude long time contracts at the current rates, looking for a materially better market shortly when payments for the Government bond issue are begun. Current quotations are as follows: 1½% for 60 days, 2% for 90 days and 2½% @ 3% for six months. Offerings are not free for periods beyond six months.

Commercial paper of prime quality is sparingly offered, and rates are firmly held at 2½% @ 3% for 60 to 90 day indorsed bills receivable, 3% @ 3½% for four months' commission house and prime four months' single names; 3½% @ 4% for prime six months' and 4½% @ 7% for good four to six months' single names.

Bar silver has advanced in London to 29 pence and in New York to 63½¢ per ounce, which were the ruling rates on Wednesday. Shipments of the metal to Europe have been liberal in the last two weeks.

New York.

Office of The Iron Age, 96-102 Reade street, }
New York, November 21, 1894. }

Pig Iron.—Aside from one order for 1000 tons for a pipe works in this State no transactions of any magnitude are reported. Lower prices are being made by some Southern furnaces, but are not stimulating the demand.

Cast Iron Pipe.—The reports concerning the order for 10,000 tons of Cast Iron Pipe for the Tokio Water Works have been decidedly premature, and in some instances ridiculous. Thus one wise contemporary, putting together the statement that the price was \$370,000, and that the quantity was 10,000 tons, figured out that the sale was made at \$37 per ton, which is fully \$10 too high. A daily paper raised the contract to \$370,000,000. The contract has not yet been closed, because an agreement as to the terms has not yet been reached. The negotiations have been carried on by a special agent acting for A. R. Whitney & Co. of this city, who are the representatives for export for the Howard Harrison Iron Company of Birmingham Ala., manufacturers of Pipe and of Sugar Machinery Castings. They have been devoting attention to this business for some time, and some months since made bids on a lot of 6000 tons of Pipe for Valparaiso. The Tokio order is the second emanating from that source. The first, for 10,000 tons of large Pipe, was taken by works at Glasgow, Scotland, at \$20 f.o.b. Glasgow, the freight rate being 30¢ per net ton. It will be observed that this price could be readily met by American shops in spite of higher freight rates. Inspection takes place at the shop. In the home trade there is not much that is new. Johnstown, N. Y., will soon have a letting of about 1800 tons and a similar amount will soon come up at Newton, N. J., together with about 2000 feet of Wrought Pipe. A moderate amount of large Cast Pipe is soon to be called for by Hoboken, N. J., for sewers.

Spiegeleisen and Ferromanganese.—A number of sales of Ferromanganese have been made lately for delivery in the Pittsburgh district at \$49, delivered. In the East the demand is slow. We quote, nominally, \$20.50 @ \$21 for 20% Spiegeleisen and \$47.50

@ \$49 for foreign Ferromanganese, tidewater. Foreign Ferro is now being shipped loose, instead of in casks, which saves a little less than \$1 per ton. It is still doubtful, however, whether loss in weight will not largely counterbalance the saving.

Billets and Rods.—The lower advices from the West are weakening the market on Billets and on Wire Rods, which we quote \$17.75 @ \$18.25 for Billets and \$24.50 @ \$25 for Wire Rods. Importers are offering English Tin Plate Bars at \$28, tidewater, for special quality which may be available for re-export business. Makers on the other side, however, decline to cut up the bars into short lengths as per specifications. They insist upon delivering the 16-foot standard lengths. We are told that in the West domestic Tin Plate Bars have been sold as low as \$20 per ton.

Steel Rails.—As yet there have been no developments. There is more inquiry, but no transactions of any magnitude are reported. There is an order in the market for 15,000 tons, delivery at Nashville.

Track Material.—We quote as follows for small lots: Spikes, 1.40¢ @ 1.60¢; Fish Plates, 1.20¢ @ 1.40¢; Track Bolts, Square Nuts, 2¢ @ 2.10¢, and Hexagon Nuts, 2.10¢ @ 2.30¢, delivered.

Manufactured Iron and Steel.—The most interesting item of the week is that bids went in recently for the four-track Blackwell's Island bridge, which with its approaches will call for about 35,000 tons of Steel. It will take about four or five weeks before the contract will be awarded. Delivery will extend over the whole of next year and 1896. There has been quite a good deal of activity in structural work during the past ten days. The Cornells have taken the Waldorf extension, calling for 8000 tons of material; the Decker Building, nine stories, at Broadway and Grand streets and the Ireland Building, seven stories, at South Fifth avenue and Third street. The Jackson Company have closed for a ten-story building at 193 Fifth avenue, another structure at 37 to 39 Maiden lane and another at corner of Thames and Greenwich streets. The Hoboken Ferry house, at Barclay street, was taken by a bridge company, involving about 500 tons. Altogether over 10,000 tons of material have been contracted for, by far the greater part going to Pittsburgh mills. In shipbuilding circles the sensation of the week is the report that the Cramps have captured an order for three armored cruisers for the Russian Navy, the Bethlehem Iron Company securing the contract for the armor. We quote: Beams up to 15-inch, 1.30¢ @ 1.50¢ for round lots; Angles, 1.25¢ @ 1.35¢; Universal Mill Plates, 1.25¢ @ 1.35¢; Tees, 1.40¢ @ 1.60¢; Channels, 1.35¢ @ 1.50¢, on dock. Steel Plates are 1.25¢ @ 1.40¢ for Tank; 1.40¢ @ 1.50¢ for Shell; 1.60¢ @ 1.65¢ for Flange, and 1.75¢ @ 2¢ for Fire Box, and 2¢ @ 2.25¢ for Locomotive Fire Box, on dock; Refined Bars are 1.15¢ @ 1.9¢, on dock, and Common 1.05¢ @ 1.15¢; Soft Steel Bars are 1.10¢ @ 1.30¢; Scrap Axles are quotable at 1.30¢ @ 1.50¢, delivered; Steel Axles, 1.30¢ @ 1.50¢, and Links and Pins, 1.40¢ @ 1.60¢; Steel Hoops, 1.40¢ @ 1.50¢; Best Iron Boiler Rivets, 2.90¢ @ 3¢, delivered; Cotton Ties, 67¢ @ 75¢ per 45-lb bundle, tidewater; Machinery Steel, 1.20¢ @ 1.40¢; Toe Calk, 1.60¢ @ 1.70¢, and Sleigh Shoe,

1.20¢ @ 1.25¢; Tire, 1.25¢ @ 1.30¢, and Spring, 1.65¢ @ 1.70¢, delivered.

Horne Bros., 6 Oliver street, Boston, Mass., announce that they have succeeded Wm. M. Horne & Co. and Winslow L. Horne as manufacturers' agents for the sale of Iron and Steel, their principal agencies being Zug & Co., Wm. Clark's Son & Co., and Union Drawn Steel Company, all of Pittsburgh, Pa. The firm of Wm. M. Horne & Co. were established upward of 20 years ago, and until 1893 were composed of Wm. M., W. L. and F. E. Horne, when W. L. Horne withdrew and continued business alone. The present partnership reunites the former members of the firm and consolidates the various agencies.

Metal Market.

Pig Tin.—Prices have continued on the downward move, and a decline of about 0.35¢ @ 0.40¢ is to be recorded for the week, prompt delivery going to 14.20¢, and futures up to May, inclusive, at the same rate. On the decline there was considerable speculative liquidation and not a little selling on short account. Except for the purpose of closing out old deals or operating against them the buying has been very moderate. Consumers have purchased very indifferently, and jobbers bought in a moderate way only. It is estimated that there are now in sight for this and European markets 25,000 tons or more, and rumor has it that the foreign syndicate has completely tired of endeavoring to carry the load. The impression here is that their operations just center upon liquidating at the smallest possible loss. Some venturesome prophets have offered to wager that Tin will be sold this year at "eight pounds for a dollar," basing their opinion upon the weight of the supply in sight.

Copper.—Lower prices have been established and the market has a weak appearance. There is more pressure to sell and less inclination to buy, besides which an unfavorable influence has existed in the form of circumstantial evidence that the proposed agreement of producers is unlikely to be effected. Lake Superior Ingot has been indirectly offered at 9½¢ and some accounts have it that speculative sales were made during the week at a fraction less. Wire Bars were sold at 9½¢. Electrolytic went at 9½¢ and may yet be secured at that price. Casting stock is down to 9¢ @ 9.10¢, according to brand, for round lots.

Pig Lead.—A fairly large business was reported early in the week at about 3 12¼¢ for common domestic and 3.15¢ for chemical, near future shipment. Since then little has been done outside of ordinary carload trades and the demand from consumers has diminished to comparatively small proportions. However, a certain amount of support is given by some traders that has sufficient force to hold prices at about 3.15¢ for prompt and 3.12¼¢ for near future shipments.

Spelter.—Dealings here have been on a moderate scale and the demand has undergone no improvement. Prices remain quite steady, however, on the basis of about 3 40¢ @ 3.45¢ for ordinary Western brands, laid down here. This steadiness is attributed to conservative offering from primary sources of supply.

Antimony.—About the ordinary business is passing. Prices vary little from

7¼¢ @ 7½¢ for Hallett's and 8½¢ @ 8¾¢ for Cookson's on the spot.

Tin Plate.—Quite a good business has been done in spot stock, chiefly moderate-sized lots, for which about former prices were paid. Futures remain extremely flat, however, although some inducements have been made in the form of about 2½¢ concession on December-January shipments. For spot stock the following prices are quoted: Charcoal Tins: Melyn Grade, one-half X IC, \$5; IX, \$6.50; Lisvane, &c., IC, \$4.30; IX, \$5.25; Allaway Grade, \$4.25; IX, \$5.05; Siemens Steel, IC squares, &c., full weight, \$4.37½ basis; 100 lb, \$4.10 basis. Bessemer Steel, IC squares, &c., full weight, \$4.30 basis; 100 lb, \$4.10 basis. Coke Tins, IC, 14 x 20: Bessemer Steel, full weight, \$4.07½; 100 lb, \$3.70; 95 lb, \$3.65; 90 lb, \$3.55. Charcoal Tins: M. F., IC 14 x 20, \$6; IC 20 x 28, \$12; Worcester, IC 14 x 20, \$4.75; IC 20 x 28, \$8.60; Allyn, full weight, IC 14 x 20, \$4; IC 20 x 28, \$8; Allyn, 100 lb, IC 14 x 20, \$3.85; IC 20 x 28, \$7.60; Dean, full weight, IC 14 x 20, \$4.05; IC 20 x 28, \$8.10; 100 lb, IC 14 x 20, \$3.90; IC 20 x 28, \$7.80; D. R. D. Grade, full weight, IC 14 x 20, \$3.90; IC 20 x 28, \$7.85; 100 lb, IC 14 x 20, \$3.80.

The monthly production of Copper in the United States has been as follows, according to John Stanton, the first column giving the aggregate returns from the reporting mines, which include the principal Lake, Montana and Arizona producers; the second being the metal from pyrites and from a number of smaller outside sources, being estimated:

<i>American Product.</i>			
	Reporting mines.	Outside sources.	Total.
	Gross tons.	Gross tons.	Gross tons.
Second half			
1892.....	59,239	6,287	65,526
First half			
1893.....	62,470	6,478	68,938
Second half			
1893.....	67,290	6,252	73,542
Totals			
1893 ..	129,760	12,730	142,480
1894.			
January...	10,832	1,340	12,172
February...	10,245	1,340	11,585
March.....	13,759	1,340	15,099
April.....	12,475	1,340	13,815
May.....	12,668	1,340	14,008
June.....	13,972	1,340	15,312
First half			
1894.....	73,951	8,040	81,991
July.....	12,639	1,340	13,979
August....	11,815	1,500	13,315
September...	11,257	1,500	12,757
October....	12,692	1,500	14,192

The product of the foreign reporting mines and the United States exports were as follows:

	Foreign reporting mines. Gross tons.	United States exports. Gross tons.
Second half 1892.....	39,655	17,980
First half 1893.....	41,048	20,361
Second half 1893.....	40,647	60,031
Totals 1893.....	81,405	80,392
1894.		
January.....	8,145	7,717
February.....	7,217	5,590
March.....	6,922	7,137
April.....	7,365	6,209
May.....	8,013	6,140
June.....	7,611	6,976
First half 1894.....	45,293	39,769
July.....	6,960	7,226
August.....	7,367	6,408
September.....	7,110	7,093
October.....	7,231	5,057

Trade Publications.

THE HENRY C. AYER & GLEASON COMPANY have just issued a 16-page booklet, descriptive of their cylinder boring machines, A. & G. self adjusting cylinder

packing and Flander's spring piston packing. Besides descriptions of the articles mentioned, the booklet contains a good deal of information in regard to the boring of cylinders.

WE HAVE RECEIVED from the W. F. & John Barnes Company of Rockford, Ill., a catalogue descriptive of their foot and hand power wood working machinery, and also their metal working tools. Among others, the list embraces circular saws, scroll saws, formers, lathes, and the many tools belonging with each. The second division of the catalogue embraces speed and screw cutting lathes, grinding and polishing machines, upright drills; three spindle drills, emery grinders, &c.

British Metal Market.

[Special Cable Dispatch to The Iron Age.]

LONDON, November 21, 1894.

Pig Tin prices have been unsettled and weak, receding to £64. 5/ on Tuesday. A large quantity of the metal has changed hands, but the market weakened under the influence of free cash sales that offset large buying supposed to have been for syndicate account. During the last few days there were free offerings of both cash lots and futures that had a depressing influence. Straits shipments were moderate during the first half of the month, owing, it is reported, to native dealers storing stock. Wednesday's market was unsettled and weak, with Straits quoted at £64. 2/6 @ £64. 5/ spot and £64. 2/6 @ £64. 5/ for three months' futures.

Copper broke on Tuesday to £39. 18/9 for Merchant Bars, prompt delivery. Previously the market was steady, offers having been quickly absorbed, while holders became very reserved. During the last few days buying was slow and prices receded. Consumers are buying quietly. Stocks increased 198 tons during the first half of the month. Visible supply increased 72 tons during the same time. Chili charters were 950 tons. Sales of furnace material recently include 4000 tons ordinary Montana Mattes to arrive, at 8/3. At the close Merchant Bars were quoted down to £39. 15/ for prompts and £40 @ £40. 2/6 for three months' futures. Best selected English is about £42 @ £42. 10/.

In Tin Plate there has been little doing and buyers of round lots have again reduced their bids. Makers are eager sellers at 9/9 for ordinary Bessemer cokes, at Swansea. There is more inquiry for small lots, odd sizes, but lowness of prices limits business. Wasters are in exceptionally good demand. Many workmen have decided to accept 10 % reduction in wages. Shipments have been small the past week. Stocks amount now to about 249,000 boxes. Swansea quotations are as follows:

Bessemer Cokes, IC 14 x 20..... 9/9 @
Siemens Cokes, IC 14 x 20..... 10/ @
J. B. Steel Cokes, IC 14 x 20..... 9/9 @ 10/
Ternes, 20 x 28..... 19/6 @ 22/
Charcoals, IC 14 x 20..... 11/ @ 13/

Pig Lead is quiet but prices are steadier at £9. 15/ for Soft Spanish.

Spelter has been rather weak at £14. 17/6 for ordinary Silesian, and sells slowly.

Pig Iron warrants have declined slightly. To-day's prices are 42/6 for Scotch, 35/6 for Cleveland and 43/6 for Hematite.

HARDWARE.

Condition of Trade.

THERE is little change in the character or volume of business since our last report. The demand from the smaller trade is mostly in the way of sorting up orders, which in view of the near approach of the annual inventory are kept down as much as possible. The fact that stocks generally are very much depleted tends, however, to make the present requirements of the merchants greater. There is also a good deal of attention being given to the market now by the large buyers with a view to placing their orders for next season. The market is therefore being watched carefully, but with the result of discovering few indications of an early advance in values. In some lines prices are, however, so low that some conservative houses are disposed to consider it wise to purchase before long. The possibility of a sudden advance as the result of concerted action among manufacturers or as a reaction from extremely low prices is recognized.

Chicago.

(By Telegraph.)

The demand for Shelf Hardware is considerably better than had been expected, and the volume of business is now so large that the month promises to surpass October. Seasonable goods have been in particularly strong request during the past week. All such articles as Stove Boards, Elbows, Stove Pipe, Coal Hods, Snow Shovels, Skates, Sleds, &c., have been called for in unusually numerous orders, in consequence of the very light advance orders entered during the fall. Merchants now find that their customers need the goods and must have them. The demand for Tin Plate has, however, fallen off; it is by no means so large as in October. Consumers and country dealers appear to have pretty thoroughly covered their immediate wants. Terne Plate is extremely dull with the close of the building season through the country generally. Tinware factories are still behind in deliveries, but manufacturers now expect to catch up with their orders in a short time. The most important event in the Hardware trade which has turned up recently is the advance in Hammers and Sledges, which came very unexpectedly and caught the great majority of the trade with very light stocks. This is taken as an inkling of similar developments

which may be expected in other articles from this time forward. It is known that many goods have for some time been selling down too close to cost to be comfortable and opportunities to advance rates will be quickly embraced whenever they arise.

St. Louis.

(By Telegraph.)

The demand for Shelf Goods continues in the satisfactory manner last noted. In fact, the general demand is keeping up remarkably well. The first two weeks of the present month will foot up in dollars and cents somewhat more than the corresponding period of 1892 and 1893. When it is remembered that prices are from 15 to 25 per cent. lower than they were two years since, it can be readily seen that the Hardware trade have no cause for complaint so far as the volume of business is concerned. The same story of unsatisfactory prices has again to be repeated and there is nothing in the immediate future to base any advance upon. Occasionally an advance is recorded, the latest being in Carriage Bolts, which are now quoted at 80, 25 and 5, St. Louis delivery. Barb Wire, Wire Nails and plain Wires are weak and unsettled, and in Barb Wire and plain Wires lower prices seem certain to prevail. Wire Nails have reached a point where it is doubtful if they can go lower. Continued improvement in the demand for heavy Hardware is reported.

Notes on Prices.

Wire Nails.—The Wire Nail market is characterized by a good deal of activity, the volume of business being fair, if not large, and the mills generally well supplied with orders. There are also many inquiries from the larger buyers in regard to stock orders for next year's trade, and it is reported that some large purchases have been made. A good deal of negotiation is going on in regard to prices, buyers hoping to obtain somewhat better figures than the low quotations now current. The tone of the market is not at all strong, and lower prices are ruling than a few weeks ago. The market is represented by the quotation of 90 cents for carload lots at mill, but this figure has been more or less freely shaded.

Chicago, by Telegraph.—Manufacturers' agents report a much larger movement during the past week. Inquiries are now heavier than for several weeks. Factories which had been running

single turn during the past month have started up double turn, in order to promptly fill their orders and prepare for the coming busy season. Prices show no disposition to advance as yet, being still quoted on the basis of \$1, Chicago, for factory shipment. Agents report that variations of 1 cent per keg now influence an order. Jobbers quote small lots from stock at \$1.10.

Cut Nails.—The Cut Nail market sympathizes with Wire Nails and is somewhat irregular and slightly lower. The quotation of 90 cents for carload lots on dock, New York, with a 60 cent average, represents the market fairly, but it is shaded a little more freely than a week or two ago. Seventy five to 80 cents at mill with a 60 cent average is a current quotation. Small lots from store in New York are held at \$1 to \$1.05.

Chicago, by Telegraph.—Nothing special has occurred in this line. Manufacturers report a fair trade for the season, and the local factory continues steadily employed. Prices are unchanged at 90 cents Chicago for 60 cent average. Jobbers quote small lots at \$1.

Barb Wire.—The Barb Wire market is evidently in an unsatisfactory condition, and within the past week or two further weakness has developed notwithstanding the fact that inquiries are more frequent and the volume of business larger. The lack of an understanding among the manufacturers, together with some outside competition, is evidently having its influence on prices. The market is represented by the quotation of \$1.85 to \$1.90, at Pittsburgh and some other points, but it is understood that lower prices have been made more or less freely. There is little change in the figures at which the jobbing trade are selling small lots from stock. Backes & Co., Pittsburgh, have issued circulars to the trade in which they refer to their facilities for furnishing Barb Wire, and quote for November shipment from Joliet, Ill., or Pittsburgh, \$1.85 for Galvanized and \$1.50 for Painted, with an advance of 5 cents for December shipment and a similar advance each month until April, for which month \$2.10 and \$1.80 are quoted for Galvanized and Painted, respectively.

Chicago, by Telegraph.—A better business is reported by both manufacturers and jobbers. The trade has again begun to take hold much better and sales of carload lots and mixed carloads of Wire Nails and Barb Wire are much more frequent. Heavy inquiries are made for Barb Wire to cover the re-

quirements of large dealers during the first half of next year. The outlook has thus decidedly changed with regard to the demand. Manufacturers, however, have not yet put themselves in perfect shape with regard to sustaining prices, but the threatening elements have so far not done serious damage. Extremely low quotations have been distributed broadcast to the trade by an Eastern house who recently leased a mill in the West, but they are of a peculiar character and the other manufacturers are inclined to pay but little attention to the competition, as the factory has only a limited capacity. Jobbers quote small lots of Galvanized from stock at \$2.20 to \$2.25, and for direct shipment from factory at \$2.10.

Cordage.—The market is very quiet, the volume of business being exceedingly small. Prices are somewhat lower, especially in Sisal and New Zealand, there being comparatively little demand for the latter. Present quotations for large lots are as follows:

	Cents.
Manila, base.....	7½
Sisal, base.....	4½
New Zealand, base.....	4½

Family Grindstones.—The Cleveland Stone Company, Cleveland, Ohio, are offering Family Grindstones at the following prices:

	Per Dozen.
6 and 7 inch.....	\$5.00
8 and 9 inch.....	5.75
10, 11 and 12 inch.....	7.75

Loose Grindstones, 30 to 200 pounds each, are quoted at \$7 to \$9 per ton. They will also be pleased to furnish quotations on Mounted Grindstones. These prices are f. o. b. quarries.

Hammer and Hatchet Case.—Herrick's Hammer and Hatchet Case, described in our issue 1st inst., as put on the market by F. A. Herrick & Co., Jackson, Mich., is sold at \$27, subject to a discount of 33½ per cent.

Vise Jaws for Tubing.—In our issue November 1 we gave an illustrated description of Spring Vise Jaws for Tubing as put on the market by the Newark Machine Tool Works, Newark, N. J. These Jaws are sold from the following list:

	Each.
3 inch.....	\$0.90
3½ ".....	0.95
4 ".....	1.00
4½ ".....	1.10
5 ".....	1.20
6 ".....	1.40

The above prices are net in less than dozen lots. In dozen lots a discount of 10 per cent. is made.

Bevel Square.—Leavitt Machine Company, Orange, Mass., are manufacturing Barrett's Bevel Square, which was illustrated in our issue, 8th inst. The square is sold to the trade at the following prices, which are net:

	Per dozen.
6 inch.....	\$6.50
8 ".....	7.00
9 ".....	8.00
10 ".....	8.50
12 ".....	9.50

Knapp's Faucets.—Knapp's Faucet Company, Syracuse, N. Y., are putting

on the market the Combination Wood and Metal Faucet, a description of which was given in our last issue. This Faucet is sold to the trade from the following list, which is subject to a discount of 25 per cent.:

	Per dozen.
No. 1, 20 inches long, for lager.....	\$36.00
No. 2, 18 " " " ale.....	36.00
No. 3, 20 " " " ale.....	36.00
No. 4, 18 inches long, for stock ale, with automatic strainer.....	42.00
No. 5, 20 inches long, for stock ale, with automatic strainer.....	42.00

Spring Balance Frame.—This Frame was described in our last issue, as put on the market by John Chatillon & Sons, 85-93 Cliff street, New York. The Frame is made in two sizes, which are sold at \$10 list, subject to a discount of 20 per cent.

Art Auger Bit.—The Art Auger Bit, described in *The Iron Age* October 4, as put on the market by A. L. Adams, Bridgeport, Conn., is sold to the trade at a discount of 35 per cent. from list.

Glass.—Since our report of last week nothing of interest has occurred in the American Window Glass market. Demand continues fair, but not up to what is usually considered a full fall trade. An increase is reported in orders from jobbers, but even these are not as large as could be wished. Prices appear to vary in proportion to the amount of orders individual manufacturers have on their books and also in proportion to the amount of confidence they have in the immediate future of the Glass trade. A fair average mill price for Glass in large quantities is given as 90 per cent. discount for single and 90 and 5 per cent. discount for Double Strength Glass, at Pittsburgh. Importers report a fair business at 70 per cent. discount from Window Glass list of October 1, but there is reason to believe that in some instances this price is shaded.

Undervaluations of Imported Enameled Ware.

THE ARREST last week of a former senior partner in a well-known New York importing house, now dissolved, on a charge brought by the Custom House officials of undervaluations to the extent of \$100,000 in invoices of Enameled Iron Ware, has caused no small stir in the trade. Inquiries among the leading American manufacturers of and dealers in enameled ware bring out the fact that the impression, or rather the conviction, has long existed among them that enameled goods of German manufacture have for years been systematically sent into this country under false valuations. Comparisons of the prices at which these goods are sold in Europe with those at which they are offered here, together with the knowledge possessed of the prime cost of manufacture in both continents, proved to the satisfaction of the American makers that the foreign goods could not be sold here with profit at the rates at which they have been offered, provided the full duty on their real value had been paid. Should this be the actual case, it is highly desirable that such a proceeding should be stopped. The alleged offender in the present case has been held in heavy bail, and the result of the present proceedings will be watched with great interest by the trade. It is rumored that a similar condition of things has been existing for some time in the case of enameled ware imports into Canada.

Hardware Club of New York.

AT THE LAST MEETING of the Board of Governors of the Hardware Club of New York, held on the 15th inst., the following persons were elected to membership in the club:

SAMUEL R. BEARDSLEY,
179 West street, New York.
ALFRED B. CHAPMAN,
62 Worth street, New York.
H. E. DEATS,
Flemington, N. J.
RALPH W. GROUT,
Henry W. Peabody, & Co.,
New York.
E. H. KIDDER,
253 Broadway, New York.
CHARLES H. LESTER,
48 Barclay street, New York.
JOHN HENRY MCCARTHY,
Justice City Court, New York.
EDWARD M. MAY,
H. L. Judd & Co., New York.
WALTER P. PHILLIPS,
General Manager United Press,
New York.
HENRY W. PUTNAM, JR.,
108 Chambers street, New York.
ALFRED H. SMITH,
131 Duane street, New York.
GEORGE F. SPINNEY,
Publisher New York Times,
New York.
FRANCIS M. UNDERHILL,
46 Barclay street, New York.

The Hardware Club, which has not occupied its apartments six months yet, has on its rolls at present 416 resident, 76 non-resident members, with 16 names to be acted on at the next meeting of the board. Since last May a total of 217 members have been admitted. At this rate it is evident the limit of resident membership will soon be reached and a waiting list begun. The club is to be congratulated on the excellence of all its appointments and on its satisfactory financial condition.

Annual Hardware Dinner.

There is already some talk among the trade indicating that they are looking forward to the annual Hardware dinner. It will be remembered that this was omitted last winter on account of the fact that the club would soon be in possession of the premises which it is now occupying. It is certainly desirable that a Hardware dinner should be held early next year, perhaps in January or February, and that efforts should be made to have it as thoroughly representative of the Hardware and related trades as possible. The rooms of the club are certainly the most suitable place for such a gathering.

WE ARE ADVISED by the Enterprise Mfg. Company of Philadelphia, Pa., that they have brought suit in the Circuit Court of the United States for the district of Connecticut against Levi T. Snow and Oliver D. Woodruff for infringement of the Baker patent of January 30, 1883, in the manufacture of a Meat Cutter designated the Connecticut Meat Chopper. The patent sued upon is the same patent upon

which other parties were enjoined some years ago in suits brought by the company.

Hardware Merchants' and Manufacturers' Association.

THE REGULAR BUSINESS MEETING of the Hardware Merchants and Manufacturers' Association of Philadelphia was held on Tuesday evening at the Hotel Metropole. At seven o'clock a collation was served and at eight a rare treat was enjoyed by the members and a number of invited guests from other cities. The speeches were admirable, full of sound business sense and sparkling with wit and repartee.

The lateness of the hour makes it impossible to give the speeches in full, although they were eloquent and able, without an exception. The genial, tactful Supplee was at his best, the Irish wit of McCaffrey never shone brighter, while Fernley as usual brought down the house with his specialties. To this galaxy of talent we must add John R. Griffiths, whose splendid voice and funny songs gave an additional charm to the evenings entertainment.

In introducing Mr. Supplee as presiding officer for the evening, Mr. McCaffrey said he was introducing a gentleman who needed no introduction to the Hardware trade, his name being known throughout the length and breadth of the land, and whose able letters to our leading paper, *The Iron Age*, are read and appreciated by the trade everywhere. After a solo by Charles Huff, a discussion was announced on "Is the System of Syndicate Buying of Advantage to the Trade in General?" Hugh McCaffrey said that he had promised to speak, but the committee had put him in a hole, as his name was on the wrong side; but as he was there on the programme there was no alternative but to go through with it. He then went into a humorous but careful review of the discussions on this subject at the Richmond convention. He gave both sides as there presented, concluding by saying: "If you wish to know which side I am on refer to your programme, and it will tell you I am on the affirmative." He then gave a most amusing account of his own experiences. The first led him to expect a tremendous business from a syndicate who had arranged to handle their goods, but after several months it fizzled out with one small order from one of his own customers. The second seemed to promise something very much better. He was visited by a gentleman of superb style, who spoke Spanish and smoked the very finest kind of cigars. Mr. McCaffrey ventured to mention his previous experience, when he was assured that this was something entirely different. "We have our own house in New York City and in London and in Mexico; we pay spot cash, and, of course, the business is very large—the syndicate business is not in it, compared with our manage-

ment." This seemed too good a chance to miss, so the terms were arranged, but it was necessary to take a half page advertisement in a certain paper; no money required; the amount could be deducted from the shipments of merchandise. This venture resulted in one small order for Files and one large bill for an advertisement.

Mr. Ritter of the Biddle Hardware Company took the negative, and, while generally indorsing the Richmond ideas, made the point that while syndicate buying might have had its advantages in its inception, it had nothing of that kind to offer now, as it had gradually gone down until it included very small concerns. Besides, they are no more to be depended upon to maintain their terms than others are. Their terms vary according to what they think they can get; hence it is to the interests of large and strong houses to buy direct from the manufacturer.

Mr. Foot of Kearney & Foot, File manufacturers, replaced one of the speakers on the negative side, who was unavoidably absent. In general terms he indorsed the remarks of the preceding speakers, remarking, however, that while there were some capable and worthy syndicate buyers, they were not all to be so characterized. One of his points was that manufacturers suffered from their competition, by being compelled to lower the quality of their goods to meet the demand for low prices. The speaker had personal knowledge of jobbers who were loaded with goods not up to standard, and also of manufacturers who had injured their reputation by supplying goods of the kind mentioned.

A very able and interesting paper was presented by William C. Peters, "A Hardwareman Abroad—What Did I Learn of Benefit to My Co-laborers?" which embodied much of interest and touched upon a good many important questions connected with the trade, while at the same time there were in it many happy references which were much appreciated.

The paper by William H. Allen on "Fifty Years a Hardwareman" was listened to with much attention and pleasure, and contained interesting recollections and suggestions of value.

A parody presented by T. James Fernley on "Spartacus to the Gladiators; or, Me to My Competitors," was timely and rendered in Mr. Fernley's best style.

The meeting as a whole was a complete success and very much enjoyed by all who were present.

A Golden Jubilee.

ON NOVEMBER 14, 1844, John Pritzlaff, now well known to the trade as the founder and president of the John Pritzlaff Hardware Company of Milwaukee, Wis., and Miss Sophia Blum were united in marriage. On Wednesday of last week the fiftieth anniversary of this

wedding was celebrated with appropriate festivities, which began at 5 o'clock in the afternoon with a special church service, at which the pastor, an old friend of Mr. Pritzlaff's, preached. The choir of the church and a singing society rendered choral songs with organ and orchestral accompaniment. The service was followed by a banquet in the evening, at which all the members of the Pritzlaff family and many invited guests were present, some 200 invitations having been sent out. All the employees of the John Pritzlaff Hardware Company participated in the celebration, which was a most successful and felicitous one. Many costly presents were received by the aged couple, whose golden jubilee will be remembered by them as one of the happiest events of their long and happy wedded life.

John Pritzlaff was born in Frutzelatz, Pomerania, March 6, 1820, so that he is in the seventy-fifth year of his age. In 1839, at the age of 19, he decided to follow a company of Lutherans to America, and reached New York after an exhausting sea voyage of four months. From New York he went to Buffalo, but unable to find any employment he walked to a point some 60 miles south of Buffalo and found employment as a day laborer on the Genesee Canal. He did this work for nearly two years and finally decided to go West, to Wisconsin. During the latter part of October, 1841, he landed at Milwaukee. He found employment at first as driver of a truck wagon and earned \$9 a month. During the summer of 1842 he served as cook on a lake schooner. The following winter he was compelled to chop wood, receiving 3 shillings a cord in store pay. In the spring of 1843 he entered the service of Shepardson & Farwell, Hardware merchants, as shipping clerk. His salary was \$200 a year, and he had to board and clothe himself. Here he remained until 1850. April 1, 1850, Mr. Pritzlaff formed a partnership with August F. Suelflohn, and opened a Hardware store at 299 Third street. Henry Nazro, who supplied them with the stock, was their silent partner. Pritzlaff & Suelflohn prospered from the first year of their partnership, although they paid 7 per cent. interest on their borrowed money and 7½ per cent. on their merchandise. Their sales for the first year amounted to \$12,000. In 1853 the partnership was dissolved, Mr. Suelflohn leaving the business. The firm became John Pritzlaff & Co. In 1866 Mr. Pritzlaff finally succeeded in buying out Mr. Nazro's interest, and became the sole head of a flourishing business house. In 1874 Mr. Pritzlaff bought the lots at the foot of West Water street, where the Pritzlaff warehouses are now located. The main building was erected in 1875. Ten years later, in 1884, Mr. Pritzlaff admitted to partnership in his extensive business his sons-in-law, Messrs. Koch, Wollaeger and Luedke, and his son, Frederick Pritzlaff. A corporation was then formed, of which John Pritzlaff was chosen president, John C. Koch vice-president, F. Wollaeger treasurer, F. Pritzlaff secretary, and August Luedke manager.

Mr. Pritzlaff is one of Milwaukee's most prominent, influential and public spirited citizens, and is deservedly held in high estimation. He is known to the entire Hardware trade as the founder and upbuilder of what has grown to be one of the largest jobbing concerns in the country. Loved by his employees, he enjoys the respect of all who know him.

Bicycles for 1895.

In the following columns we give further information in regard to prices and patterns of wheels which will be put on the market by manufacturers during the coming season, with special reference to the Hardware trade, through whom Bicycles will evidently be marketed to a much larger extent than ever before.

NEARLY all the Bicycle manufacturers are making preparations for an increase over their last year's output of machines, and the sentiment is almost universally expressed that the demand for wheels during 1895 will largely exceed that of the past season. The interest in bicycling is unquestionably on the increase, this having been forcibly shown in one direction by the early demand for an announcement of next season's prices and information regarding the product of the various manufacturers, by the Hardware trade and those interested in Bicycle matters generally. In view of the large number of Hardware concerns who have made a success of their Bicycle department, and for the benefit of those who are anticipating the addition of Bicycles to their stock, we invite attention to the articles by persons conversant with the cycle trade, from the retailers' standpoint, which we are publishing. These articles contain information of value to beginners in this line, and at the same time offer suggestions to those who have had experience in it, inasmuch as the methods of no two concerns in handling any line are precisely the same.

THE YOST MFG. COMPANY, Yost Station, Toledo, Ohio, in an illustrated pamphlet entitled, "The 4 Runner of 1895," show colored representations of the Gold Crank Falcon light roadster No 4, weighing 21 pounds, listing \$100; No 3 Falcon roadster, weighing 24½ to 27 pounds and listing \$85; No. 6 Falconess, weight 27 pounds, list \$100; No. 5 Falcon, 26-inch, weight 21½ to 24 pounds, list \$65, and No. 7 Falconess, 26-inch, weight 25 pounds, listing \$70. The company state that they are now prepared to supply sample wheels and stock orders, believing that there are great advantages to be gained in entering a field early.

GORMULLY & JEFFERY MFG. COMPANY will have the following Ramblers on the market for the coming season: No. 12 weighing about 26 pounds, all on; No. 14, weight about 22 pounds, all on; No. 10, weighing about 15 or 16 pounds; No. 11, weighing about 35 pounds, all on; Model D, weighing about 26 pounds, all on; Model E, weighing about 20 pounds, all on, and the Rambler tandem, weighing about 50 pounds or less. A circular to the company's agents gives the foregoing information, together with the detailed construction of the various machines. The company state that many improvements will be embodied in the 1895 line of wheels, and that they will list all their Bicycles at \$100, and their Tandems at \$150.

THE ST. LOUIS REFRIGERATOR & WOODEN GUTTER COMPANY, St. Louis, Mo., issue reproductions of photographs in portfolio form, showing tests of the strength of various parts of their Lu-mi-num Bicycles. Two men, weighing together 345 pounds, are shown standing, one on each end of a handle bar, without injuring it. Other tests are shown applied to the frame as a whole, to the rear fork, to the front fork, &c. In connection with this is a book containing a large number of testimonials from 1894 riders. The company expect to issue a preliminary catalogue in a few days and on January 1 their regular trade catalogue.

THE PURITAN CYCLE WORKS, Portland, Maine, will place on the market for 1895 wheels listing \$135, \$125 and \$100. The \$100 wheel, it is remarked, will be in every respect equal to any machine listed at that price. The manufacturers emphasize the point that their 21-pound wheel will weigh just 21 pounds, and that their 17½-pound wheel will weigh just that and no more.

HITCHCOCK MFG. COMPANY, Cortland, N. Y., in addition to the information regarding their 1895 plans, given in our last issue, advise us that an improved sprocket is to be used on the Cortland wheel. The cone, it is explained, is placed directly in the hub of the sprocket wheel, thus giving the chain a direct pull on the balls. The company state that this is a principle not found in other makes of wheels.

C. F. GUYON COMPANY, 97 and 99 Reade street, New York, who last year were agents for the Monarch Cycle Company, Chicago, in the Eastern and Middle States, handled the business so acceptably that the Monarch Company have now established an Eastern branch under their care and constituted them the managers of this department. Their territory will include New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia and West Virginia and all the New England States. The C. F. Guyon Company have employed Geo. Pixley, favorably known in the trade, as superintendent of agencies, together with a force of six salesmen to assist him.

ROUSE, HAZARD & CO., Peoria, Ill., after stating, in a circular letter to their agents that they are not quite ready to make their complete announcement for '95, but that they will soon be ready to give full particulars, remark in part as follows:

We desire to say, however, that our line will be greatly improved and enlarged for '95, and our agency will be even more valuable than it has ever been before. Our goods will be greatly

improved and lightened in weight with no reduction in strength, and our machines will be thoroughly up to date and on the most improved, graceful and handsome lines. Furthermore, we have made contracts for material, &c., upon a basis such that we know we are upon the ground floor, hence, we shall be in position to name prices that will be absolutely right, both net and list. We shall be in position to take first-class care of our agents in every particular.

THE WINTON BICYCLE COMPANY, Cleveland, Ohio, send the following advices relating to their line of wheels for 1895, and also to improvements which will be introduced:

Our line for 1895 will comprise seven new models, to be known as Nos. 8, 9, 10, 11, 12, 14 and 15. Frames will be made in five different heights, with two lengths of heads. Our new racers will be the most rigid wheels in their class, and will weigh 16 and 17 pounds, according to height of frame and weights of tires. The new light roadsters will weigh 20 and 21 pounds, with full roadsters at 24 and 25 pounds. Our ladies' wheel (No. 15) is an entirely new wheel, very attractive in appearance and weighing, all on, 23 pounds. By a new method of attaching the cranks and sprocket wheel, we are enabled to bring the tread down to 5¼ inches on all of the new models, without narrowing the crank bearings. This new way of attaching the cranks is very much neater appearing than the old way of keying cranks, and is stronger and more durable, besides being much easier to attach or detach. By tapering the bottom braces and the diagonal brace through the frame, the strength of the frame is materially increased as is also the general beauty of the machine. No expense has been spared to bring our 1895 models up to the very highest standard of excellence.

HIBBARD, SPENCER, BARTLETT & CO., Chicago, will have a line of wheels for the coming season listing from \$100 to \$20, including high grade and modern machines, regarding which they send the following information:

We shall put on the market this year a line of wheels called the Ajax Cycles which will comprise the following: A strictly high grade gentlemen's and ladies' wheel listing at \$100, the gentlemen's wheel weighing 21 pounds, the ladies' wheel weighing 25 pounds. The gentlemen's wheel will be made in two styles of frame—high and low. Besides these high grade wheels, our line of medium grades will be complete as heretofore, composed of the following wheels: Gentlemen's wheel, 28-inch, both high and low frame, weighing 27 pounds, listing at \$75; ladies' wheel, 28-inch, double tube, weighing 27 pounds, listing at \$75; 26-inch youths' wheel, listing at \$50; 26-inch ladies' and girls' wheel, listing at \$50; 24-inch boys' wheel, listing at \$40; 24-inch girls' double tube wheel, listing at \$40; 24-inch straight frame boys' wheel, listing at \$25, and a 20-inch straight frame boys' wheel, listing at \$20. Our wheels have been vastly improved in style and finish.

THE PEERLESS MFG. COMPANY, Cleveland, Ohio, write as follows regarding their line of wheels for the coming season:

Our line of wheels for 1895 will consist of a full roadster weighing 24 pounds and a light roadster at 20 pounds, both of which will be made in three heights of frames with level top tubes. We will also have a ladies' wheel with a straight frame, double tube, weighing all on a trifle under 24

pounds and another ladies' wheel of the same pattern as our '94, which will weigh about 28 pounds. These wheels will all have several new features of adjustment, detachable sprocket wheels, narrower tread, &c., which will commend them to wheelmen and will be talking points in their sale. They will be strictly high grade in every particular. In addition to these we will also have a track racer enameled blue and called our Blue Bird, as it has been known during the past year, at from 17 to 18 pounds.

THE CRAWFORD MFG. COMPANY, Hagerstown, Md., advise us as follows regarding the Crawford line for 1895:

Our line for the coming season will consist of the following machines: Nos. 19 and 20, 28-inch, diamond and drop frame, strictly high grade; Nos. 17 and 18, 28-inch, diamond and drop frame; Nos. 11 and 12, 26-inch diamond and drop frame; Nos. 13 and 14, 24-inch, diamond and drop frame.

The tires used will be the Columbia single tube (Hartford Rubber Works Company), the Akron, Summit and Competition (the Columbia Rubber Works Company), the Dunlop (American Dunlop Tire Company), and the Morgan & Wright.

The company state that they will exhibit at the National Cycle Show, Madison Square Garden, January 19 to 26, 1895, spaces Nos. 78 and 79.

THE BUFFALO TRICYCLE COMPANY, Buffalo, N. Y., express the opinion that manufacturers and Hardware merchants are mutually benefited by the latter handling wheels, and refer to their Bicycles for the coming season, in part as follows:

We appreciate the fact that Hardware dealers throughout the country are looking to the sale of Bicycles to help increase their profits, and believe with you that it is a wise move on their part, and that it is a good thing as well for the Bicycle manufacturers.

For 1895 we will have under our regular names of Envoy and Fleetwing a 26-inch and 28-inch size of each kind. These wheels are thoroughly up to date in every respect and guaranteed by us to be fully high grade and guaranteed in the most liberal way. The 28-inch Envoy is a man's wheel, of diamond frame, high back and most approved pattern, finished in first-class shape throughout and weighing 23 pounds. The 26 inch Envoy is practically of the same construction, only of smaller dimensions throughout. The Fleetwing is a ladies' wheel of the drop frame pattern, and is made in two sizes, 26-inch and 28 inch, the 28-inch size weighing between 25 and 26 pounds, the 26 inch size correspondingly lighter. All bearings in our wheels are of the very best material obtainable, and are carefully ground to assure perfect contact. The hubs are turned from the solid bar, in which we insert bearing cases, also turned from the solid bar. We have aimed this season to give the public a really first-class Bicycle at a moderate price, and have therefore decided upon a list of \$75 for each of the 28-inch wheels and a correspondingly lower list on the 26 inch wheels. We are preparing ourselves to turn out great quantities of these wheels.

Bicycle Items.

SCHOVERLING, DALY & GALES, 302 Broadway, New York, are now taking importation orders on an entirely new line of Bicycle Lamps just brought out, samples of which they now have on exhibition. These Lamps, the predominant characteristics of which

are small size, light weight and moderate cost, are made by Powell & Hammer, Birmingham, England, for whom Schoverling, Daly & Gales are agents in America. There are nine styles of lamps, ranging in price from \$1.10 to \$7 each, subject to 50 per cent. discount to the retail trade.

GEORGE N. PIERCE & Co., Buffalo, N. Y., will show at their New York office, 107 Chambers and 91 Reade streets, in a few days a new 20-inch pneumatic tired Bicycle for children from four to ten years of age. This, the manufacturers state, is the only 20 inch pneumatic Bicycle made, that it will be very attractive in appearance and made of the best material.

THE MONARCH CYCLE COMPANY, Lake and Halsted streets, Chicago, have increased their cash capital by paying in \$100,000. Their paid up capital is now \$300,000, with a surplus of \$140,000, thus giving them ample funds for conducting their extensive business. Improvements are constantly being made in their factory. They occupy a six-story building, containing over 100,000 square feet of floor space. An electric light plant has just been installed. The company expect to place about 15,000 wheels on the market during the season of 1895, comprising five styles of different weights and patterns. They take pleasure in announcing that George H. Pixley is now connected with C. F. Guyon Company, 97 and 99 Reade street, New York, the Eastern branch of the Monarch Cycle Company. Mr. Pixley will act as superintendent of agencies. He is well known in the Hardware trade and is regarded as one of the best salesmen in the Bicycle business. He was formerly with Hall Safe & Lock Company and afterward was superintendent of agencies for the Wheeler & Wilson Mfg. Company. In 1891 he represented Lozier & Yost of Cleveland, in 1892 R. L. Coleman & Co., the Eastern branch of the Western Wheel Works, and last season was with the Crawford Mfg. Company. His experience in the Bicycle line will now be used for the benefit of the Monarch Cycle Company.

Wants Catalogues, Circulars, &c.

I. T. MENELEY, Hardware merchant of Rossville, Ill., who was burned out on July 10 last, is now located in his new building. Inasmuch as his supply of trade catalogues, price-lists, &c., was destroyed in the fire, Mr. Meneley advises us that he would be very glad to receive from manufacturers and jobbers copies of such printed matter as they send out.

IN OUR LAST ISSUE, under the heading of "It Is Reported," it was stated that Foote & Shear Company, wholesale Hardware, 513 Lackawanna avenue, Scranton, Pa., were removing to their new quarters on Washington avenue. This statement was an error, we are advised, the facts being that the company will not remove from their pres-

ent address until April 1, 1895, their new building being now in course of construction. The aggregate floor space of the new establishment will be 28,000 square feet, instead of 18,000, as reported.

The Selling of Bicycles by Hardware Merchants.

BY HENRY M. GAY.

I HAVE been selling Shelf Hardware to the larger retail Hardware trade on the road since 1867, principally to larger towns in Wisconsin, Michigan and Minnesota, but the average retail Hardware dealer in my territory is as "scary" of the Bicycle business as he would be of the Sewing Machine business, and gives the following as the principal reasons for taking this position:

Objections.

No living man can do a Bicycle business on a cash basis. The business must be run on credit or on installment plan.

It would be necessary that we run a machine shop for repair work, &c.

The wheels would take up more room than we have to spare for such slow selling goods.

There are now so many lines of wheels in the market, all claiming to be the best, that we would have to keep a different make or style for every customer we might strike.

We do not ride a wheel, and there is no one in the store that does or that understands the wheel business, which would put us to a disadvantage as against a regular Bicycle dealer.

Look at the number of Bicycle dealers here and see how little they are making, and how few of them make a success of it.

Answers to Objections.

To these several objections I make the following replies:

Bicycles can be and are being sold for cash by many retail Hardware dealers at a good profit, and even if some do have to be sold on credit the same discretion can and should be shown as in selling a Stove or a bill of house trimmings. It will not be good business policy to sell a \$100 Bicycle on time or on the installment plan to a person who is earning only \$6 per week and who must depend upon his savings to pay for his wheel.

It is not actually necessary that you should run a machine shop to be in the wheel business. I know of many Bicycle dealers among the retail Hardwaremen who avoid their expense and who make a success of the business. Some retail Hardware dealers in larger cities now sell goodly number of stoves yearly and do not keep a tinner or run a tin shop in any sense of the word. These men are merchants, not storekeepers, and understand their business. I also know of retail Hardware dealers who sell as high as 25 wheels per season who do all their Bicycle repair work in their own tin shop and their tinner is now getting to be quite expert at re-

pairing Bicycles. There are 25 Hardware retailers in one city where I go to who are selling Lawn Mowers. Not one of them is prepared to do a general Lawn Mower repair business in its fullest meaning. Still these people all sell Lawn Mowers and some of them sell 25 to 50 per year now, while when they first started out they were afraid to put in any Mowers. They would order them one at a time as they found a customer for one. The same rule applies to Bicycles as to Refrigerators, Lawn Mowers, Clothes Wringers, Steel Ranges, Gas Ranges and many other items which in former years were sold principally by firms who sold one of these items only. No trouble about the machine shop part of the business. What one cannot do in that line properly can be done at factory or elsewhere.

It Will Pay to

devote a reasonable amount of room or space to Bicycles in a store. Some retail Hardware dealers fill up the lightest and most valuable portion of their store with such goods as Mounted Grindstones, Stove Hollow Ware, Stove Pipe, Saw Bucks, Wagon Jacks, Wheelbarrows, Caldron Kettles, Building Paper, Fence Wire, Poultry Netting, Horse Pokes, Post Hole Diggers, &c. All such goods sell at little or no profit to the retailer and can be kept in the cellar or basement or in the warehouse or on an upper floor if there is an elevator. These goods can be sold without having any special talent as a salesman. They sell themselves, consequently they are kept in the foreground. These store keepers tell you they have no room for Bicycles. On the other hand, some modern Hardware merchants sell 10 to 20 Bicycles during a season and never find it necessary to keep over two or three samples in sight.

Assortment.

There is no more necessity for carrying a large variety of makes of Bicycles than there would be of Refrigerators. Select one or two good makes, always including one high grade of established reputation, made by a manufacturer of good repute. Secure a wheel that has a sufficient number of good points that will command themselves to buyers of Bicycles and then sell that wheel against all comers.

The Salesman.

Learn to be a salesman.

A salesman does not have to be a bicyclist to sell wheels. Some large Carriage dealers are neither coachmen nor horse jockies. You don't need to be a chopper to sell Axes or a cook to know how to sell House Furnishing Hardware. A Hardware dealer cannot expect to learn all the trades to fit himself for selling tools

Bicycles and Hardware.

Because exclusive Bicycle dealers fail in many instances to make a success of selling wheels at a profit the wide awake retail Hardware dealer

should not take fright. The exclusive Bicycle dealer had to run a whole establishment for the wheel business alone. A merchant has his establishment in good working order and can add one more line without adding perceptibly to your present expenses. Again, a merchant has more people coming into his store than the exclusive Bicycle dealer has in his. He has been established in business for years and has many friends who will trust to his judgment in the matter of selecting a Bicycle, even though there were an exclusive Bicycle house on either side of you.

My advice to the retail Hardware dealer who is so timid on this subject would be to try the thing before he condemns it.

Successful Merchants.

Very few retail Hardware dealers, proportionately, who have ever given the Bicycle business a fair trial have discontinued it. They learn to like the business and usually end up with rid-

ing a good wheel themselves. Don't get too many makes on the start. You'll soon be able to judge for yourself as to that part of it. Go lightly on Bicycle sundries until you get further along in the business. Your customer will, as a rule, wait until you can get in what he wants in that line from headquarters.

A Growing Business.

Let it be known far and wide that you are in the Bicycle business with the rest of them. Conduct the business on the same lines as you do in other important items in your stock. Think for a moment of the hundreds of thousands of wheels now in use and the probable increase to be expected on an article that is growing in popular favor, and that has come to stay, and decide to get your share of the benefits to be derived in the way of profits on sales that will surely go to those who are not afraid to tackle the wheel business. Don't be a turtle, be an eagle.

Letters from the Trade.

Our readers are invited to discuss in these columns questions of trade interest connected with the manufacture or sale of Hardware. We shall be pleased to have a free expression of opinion on subjects deserving the attention of Hardware merchants and manufacturers.

Low Prices and Low Quality.

Referring to the fact that in more than one line the low prices ruling for many kinds of goods are accompanied by a decline in quality, the following comment from a well-known manufacturer may be of interest:

So far as our experience is concerned we have never seen anything quite so bad as the present time. The prices on goods such as we manufacture have been on the decline for a number of years and at a rapid rate, but the decline in quality has been much more rapid, until to-day the markets are flooded with goods of the most worthless description. However, we think we can see in the dim future prospects more encouraging. While trade is not all we could desire it is better in the fact that people are about tired of poor goods, and the purchases of better lines are on the increase.

Local Associations.

While merchants in many places, large and small, are considering the advisability of forming local associations, one object of which is to regulate prices at which they sell staple goods, in the handling of which there has for some time been little, if any, profit, it is not always felt necessary to have a formal organization, a simple agreement among the parties being sufficient. In other cases associations are formed something on the lines suggested by the Ohio Hardware Association, as referred to in our last issue. The feasibility of dispensing with the machinery of a formal organization is referred to in the follow-

ing communication from a gentleman connected with one of the most successful local associations in the country:

Our association has no constitution or by-laws. At the time it was formed several lawsuits were pending in the Federal Court here against some trusts and combinations, and to avoid litigation and trouble we had nothing but an organization. There is really no need for any by-laws or constitution. All that is necessary is for the parties to meet together and agree on the price at which they will sell certain articles. If the agreement is made in good faith no bond will be necessary, and if not made in good faith, no bond or obligation will force them to live up to it.

Any departure from agreed prices is reported, with us, to a committee, whose business it is to go to the party accused of breaking the agreement, and, if necessary, examine his books. If he says it was an error and promises to do so no more, the price is allowed to remain, but if for any reason the party says he proposes to cut the price, the article is taken off the list and every man allowed to sell at any price he can get. One man with us can fix the price of any article, or, in other words, the price is not fixed without the unanimous consent of all the members of the association.

It is all based on mutual confidence, without which no organization will stand. We found in 90 per cent. of the cases where complaint was made that no cutting of price had occurred, and when it had been done, it had been caused by ignorance or misunderstanding on the part of the salesman. Our association has paid us handsomely for the trouble, and I regard it as the only way out of our chaotic condition.

Sportsmen's Exposition.

PREPARATIONS for the Sportsmen's Exposition at Madison Square Garden, New York, May 13 to 18, 1895, are actively progressing and the project is not only taking definite shape but its success appears to be assured. When the plan was first broached there was a possibility of its being merely a trade's display, but after a careful and full canvass of the situation the scheme was gradually broadened so as to illustrate the evolution and growth of all that pertains to the life and pursuits of the sportsman, thus making a display which will be of exceptional interest, not only to the class for which it is especially intended, but also to the public at large.

A preliminary illustrated prospectus just issued, besides giving much necessary detailed information, emphasizes the fitness of the place selected for the exhibit, the best for such a purpose in America. Occupying an entire square in the heart of the city, with 40,000 square feet of floor space for displays, surrounded by 5000 seats and 172 private boxes, and illuminated by 3000 electric lamps, with proper management the wealth and fashion of this and neighboring cities should be attracted. The horse show, just closed, which was a highly profitable enterprise, indicates what can be done there, especially as the exposition being matured will naturally appeal to a large proportion of the same class. It is the intention of the Executive Board to issue new prospectuses, from time to time, keeping those interested promptly advised of the progress made.

We are indebted to Frederick S. Webster, secretary and curator of the Sportsmen's Exposition Association, for the following advices in regard to the scope of the exposition:

The directors recognized the importance of having the enterprise embody every feature which would place the exposition on an educational, practical and profitable basis. This was considered fundamental. In this event the affair would assume a dignity and importance not to be questioned. That this has been practically accomplished is evidenced by the prompt co-operation of every one who has been approached on the subject. The universal interest manifested on all sides in the undertaking and the unanimity of good will accorded is encouraging and inspiring.

The directors have laid out the plans accordingly, feeling convinced that the first Sportsmen's Exposition will be an assured success. It is to be made attractive and interesting, and every means devised to draw the public, whether amateur or professional. The practical advantages to accrue to the exhibitor will be much more surely attained by invading the ranks of the novice, and the amateur by the educational and historical features than by any other means, and this has been fully provided for.

The Board calls your attention to the several branches (14 in number) which defines the general character of the undertaking, but will admit only of a brief outline here.

CLASS A, Firearms of every description, ancient and modern.—This is a very important industry from the manufacturers' standpoint. Every style of Firearms manufactured, formerly used and now in use, and as they appear in various stages of construction, will be exhibited.

CLASS B, Ammunition.—Another important branch, will embody various kinds of Powder, Shot Shells and methods of making the same. The appearance of Powders in the several conditions of manufacture. Their relative force and effectiveness will be illustrated with targets and diagrams. The material used in manufacturing ammunition will be systematically arranged.

CLASS C will be no less extensive than the preceding. The display of sporting sundries and appliances fill up a large share of the sportsman's necessities. They are too numerous to name in this schedule, but they will be comprehensive and complete in every respect.

CLASS D.—Fishing Tackle appeals to the disciples of "Old Isaac," and it will not be uninteresting or deficient, and will contain collections of Rods, Reels, Hooks, Spoons, Artificial Flies, Lines of every kind, from the silken thread to the whaler's cable. Nets, Scoops, Seines and Dredges. Baits of every sort, appliances to capture the game fish, also the methods of preserving and transporting the same.

CLASS E will include various styles of Boats from that of the Indian Canoe to the finest Racing Shell.

CLASS F, Camping Outfits and Utensils.—Includes a host of necessary articles, and will show many new appliances and articles, which serve to make camp life convenient and comfortable, such as Tents, Beds, Bedding, Stores and Cooking Utensils, the arrangement of the same during camp life, and, so far as practicable, realistic groups showing the home of the hunter when camping. This class will offer a splendid opportunity to introduce the picturesque—camping scenes with the camp in full rig, the hunters in costume and other accessories naturally belonging to this sunny chapter in the life of the sportsman.

CLASS G, Athletic Goods, will include articles manufactured for the athletic sports, such as lawn tennis, archery, fencing, baseball, football, cricket, golf, curling, racing, skating, bowling and other field and lawn games. Models and charts showing how the games are played will be introduced; also the literature giving a history of the several games and the laws governing them.

CLASS H will cover the whole zoological and practical side of the hunters' work. Upon this branch falls a large share of the burden of making the exposition attractive and instructive. It will not be lacking in extent or character. There will be a complete museum of skins, skeletons and mounted specimens, single and in groups, of every animal followed by the hunter, and considered worthy of the attention of the sportsman, whether it is an animal, a bird, a reptile or a fish. When grouped they will make up a grand display, and will undoubtedly be a drawing card of the exposition. Arrangements will be made for the preparation of a number of picturesque groups of natural mounting, representing hunting scenes of different nations. They will be realistic and strictly accurate from the ethnologists' and naturalists' standpoint. The taxidermic features of the display will be represented by splendid exhibits of the best taxidermists in the country, and every effort will be made to induce foreign preparateurs to take part in this exhibit.

Efforts will be made to have tanks

of living trout, bass, salmon and other food fish, showing the several stages of growth, and the methods of propagation and protection. Also such living animals as can be obtained, including buffalo, moose, elk, deer, antelope, mountain sheep, wild boars, rabbits, hares, pheasants, quail, grouse, &c.

Collections of various kinds of traps and devices for killing and capturing game. Skins and skulls of every fur bearing animal slain for commercial purposes. Tables showing the Zoological classification of all the animals in the exposition and the number killed in order to supply food and aid in clothing man.

CLASS I.—Kennel Supplies will form an interesting group and include all kinds of dog food manufactured, improved kennels for benching and feeding, transportation crates, dishes and watering troughs, dog medicines and surgical instruments, books on the care and training of various kinds of dogs, literature defining the status of the dog as personal property and the advancement in dog history.

The Society for the Prevention of Cruelty to Animals, it is expected, will be induced to exhibit the methods adopted for the humane protection of the canine race. It may be desirable to have a specimen of every species of dog used by the sportsman, and also with each dog specimens of the animals which they pursue as game.

CLASS K.—Cameras and Photographer's Supplies will be well sustained and in every way unique. A full display of photographs showing the work of the camera in every field, and its practical advantage to the sportsman and naturalist as a means of study of our wild animals.

CLASS L will be devoted to the horse, and his uses as adopted and applied by the sportsman in his pursuit of game. Saddles, bridles, spurs, whips, and general equipment. Here fox hunting, coursing and falconry will be illustrated.

CLASS M.—Sportsmen's Art and Literature will be the library of knowledge of the exposition. Copies of every volume published for the sportsman's use and information. All the publications devoted to field sports will be represented. Engravings and paintings will form an interesting gallery of art. Illustrations showing the sports of ancient days will form a part of the collection.

CLASS N, Trophies of the Chase.—This class will consist of collections of typical examples of our large game. It will represent largely the educational features of the exposition and include mounted heads and entire specimens of buffalo, musk ox, moose, caribou, reindeer, Virginia and black tail deer, mountain sheep, antelope, mountain goat, European stag, roebuck, chamois, wild boars, black, brown, grizzly and polar bears, &c.

The Committee of Records and Measurements will carefully measure all the specimens and reliable data will be recorded bearing on the display. From these tables of comparative measurements the committee will decide what specimens are worthy of being known as the "kings of record."

Private persons and museums will contribute from their collections.

The management wishes to emphasize the importance and value of universal co-operation and necessity of the best trophies being in the collection.

A neat monograph of this exhibit will be published with full descriptive text and effective illustrations. By this means a valuable contribution to the history of our North American and European game animals will be secured.

Specimens showing the abnormal growths of horns and antlers, also

skins showing albinism and melanism, are desirable.

CLASS O.—The Loan Exhibit will include various styles of hunting costumes and accouterments from the time of the early trappers' day up to the present. Old Firearms, Kentucky Rifles, Flint-lock Guns, Punt Guns and Ducking Cannons in contrast with the modern Breech Loading Guns, Rifles and Trappings will be shown.

Spears, arrows and other primitive weapons. Various styles of foot gear. Different kinds of snowshoes and sleds.

Primitive saddles, bridles, lassoes and whips. Originals and models of canoes, skiffs, boats and other sailing craft.

Fishing hooks and harpoons of the natives. Tackles, nets, spears and devices of the Indian for capturing fish and other aquatic animals.

Also photographs, engravings and paintings of animals, hunting scenes and camp life.

In fact, everything within the realm of the sportsman which will illustrate the evolution and advancement in firearms and implements for hunting during the earlier centuries in contrast with the scientific methods of the chase of modern times.

The management wishes to carry out to the letter the object of the exposition and, in order to accomplish it, must depend on the sportsmen of the world for general co-operation and assistance.

The Committee of Measurement and Records is composed of well-known gentlemen, who have kindly consented to serve the exposition.

HON. THEODORE ROOSEVELT.
ARCHIBALD ROGERS.
GEORGE BIRD GRINNELL.

The Illinois Pure Aluminum Company's Catalogue.

THE ILLINOIS PURE ALUMINUM COMPANY, Lemont, Ill., issue an interesting catalogue and price-list, illustrating a large and varied line of Aluminum Cooking Utensils, steam jacketed Kettles, other vessels and many specialties. The manufacturers claim for these goods that they are entirely free from poison, that they are practically everlasting, that in them food may be cooked quickly and without scorching, that they are three and one half times lighter than copper and that they are easily cleaned. The following partial list of the more prominent goods manufactured by the company, together with list prices, will afford an idea of the scope of the line, also of the cost of the goods. The following prices are subject to a discount of 50 per cent.:

Lipped Sauce Pans, with Handle.

Quarts.	Polished.	Satin finish.
		Per dozen.
1	\$5.10	\$4.70
1 1/2	6.80	6.40
2	10.20	9.80
3	13.60	13.30
4	16.70	16.60
5	22.50	21.50
6	26.00	24.50
7	31.00	28.00
8	34.50	31.00
	39.60	35.00

Lipped Preserving Kettles.

Quarts.	Polished.	Satin finish.
		Per dozen.
2	\$13.60	\$13.30
3	16.70	15.00
4	22.00	19.50
5	25.00	22.75
6	29.00	25.50
7	32.00	28.25
8	36.00	31.50

Baking Pans.—Per Dozen.					
Inches.	7 1/4	8 1/4	9 1/4	10	10 1/4
Polished.	\$7.00	\$12.50	\$15.00	\$19.50	\$24.50
Satin finish.	6.50	11.50	13.50	18.00	20.50

Cast Tea Kettles.					
Quarts.....	5	6	7	8	
Each.....	\$3.50	6.10	6.50	6.80	

Spun Tea Kettles (Seamless).					
Quarts.....	4	5	6	7	8
Each.....	\$5.10	5.80	6.00	6.50	6.80

Spun Coffee Pots (Seamless).					
Pints.....	3	4	5	6	8
Per dozen...	\$30.80	33.60	35.70	38.30	43.30

Spun Tea Pots (Seamless).					
Pints.....	3	4	5	6	8
Per dozen...	\$34.60	37.80	39.70	42.30	47.50

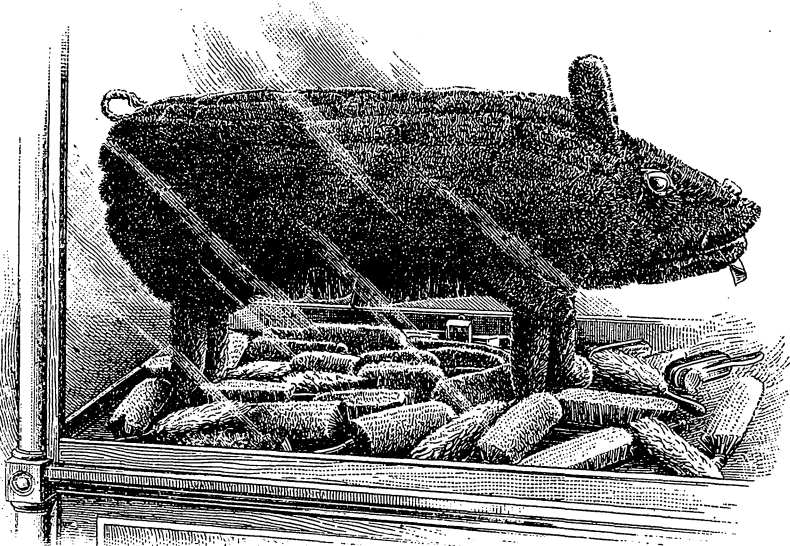
Windsor Sauce Pan.					
Quarts.....	1	1 1/2	2		
Per dozen...	\$10.80	16.20	21.00		
Quarts.....	3	4	5		
Per dozen...	\$24.20	30.00	34.40		

Windsor Kettles.					
Quarts.....	2	3	4	5	
Per dozen...	\$7.00	23.20	29.00	33.40	
Quarts.....	6	7	8		
Per dozen...	\$36.80	40.20	43.60		

In addition to the goods of which prices have been given, the company

Goods. A pig was made of brushes and placed in their show window, as shown in the accompanying illustration.

The foundation of the body was made up of six bushel baskets, five of which were nested and the other one inverted, and to these were wired floor, counter and window brushes, entirely covering the baskets. A frame of 3/8 x 2 inch strips constituted the head, to which brushes were wired, leaving a place for the mouth, in which an ear of corn was placed. Incandescent electric lamps formed the eyes, connected to a wire running down behind the animal, and at night the lamps were lighted. The tail was made of hemp braided, and the legs of counter brushes with the handles down. After the pig was placed in the window the floor was covered with brushes, and the lower portion of the legs were banked up, so that the counter brush handles did not show.



A Brush Exhibit.

manufacture out of Aluminum the following articles: Dippers, Drinking Cups, Cups and Saucers, Child's Night Food Cups, Soup Tureens, Funnels, Pancake Covers, Hotel Pans, Stock Pots, Fry Pans, Wash Bowls, Spittoons, Butter Dishes, Cracker Bowls, Camp Cooking Outfits, Sanitary and Water Pails, Water Pitchers, Candy or Confectionery Pans, Glue Kettles, Milk or Rice Cookers, Chafing Dishes, Spoons, Spoon Holders, Sugar Bowls, Peppers and Salts, Tea Strainers, Horse Bits and other specialties. The catalogue, which is of more than usual interest as illustrating a relatively new and important line, contains a large number of testimonials relating to Aluminum ware.

A Brush Exhibit.

PRESTON BROTHERS of Norwich, Conn., recently brought to the attention of the public in a very unique and effective manner the fact that they carried a large line of Brushes in connection with their stock of Hardware, House Furnishing and Sporting

The window was also dressed with all the different kinds of brushes the firm handle. The animal when completed measured a little over 7 feet. The display proved a great success and attracted much attention.

Trade Items.

JULIUS BERBECKER & CO., for nearly a quarter of a century at 65 Duane street, New York, until burnt out last spring, have sold out their entire business to the Tucker Mfg. Company, Waterville, Conn. In addition to their own foreign and domestic business they represented the Tucker Mfg. Company and William Schollhorn Company, New Haven, Conn.

THE SHIRK REFRIGERATOR COMPANY, whose Chicago office and wareroom was destroyed by fire October 15, are now located at 254 Madison street, near Market. Their loss will not cause inconvenience in any way, as they have a stock of goods at their factory which will enable them to ship promptly. They have in preparation a new catalogue, describing improvements planned for the season of 1895, which will very shortly be ready for distribution.

THE HARDWARE ESTABLISHMENT of John H. Clark, Nashua, N. H., cele-

brates this year its seventieth anniversary. The store was established in 1824 by the Nashua Mfg. Company, and in 1826 was sold to Isaac Spaulding, who conducted it until 1837, when Kendall & Gould came in and continued until 1840. Then it passed to the ownership of Monroe & Taylor, and in 1843 to Charles H. Nutt. In 1889 the present proprietor, John H. Clark, took possession and has continued ever since. Mr. Clark has been connected with the establishment in all 27½ years, and is one of the best known Hardwaremen in New Hampshire.

AS APPEARS from their advertisement in this issue, Smith & Egge Mfg. Company, Bridgeport, Conn., besides manufacturing Sash Chains, Padlocks and Plumbers' Specialties, are prepared to estimate on Models, Special Tools, and the manufacture of all kinds of Sheet Metal Novelties.

THE WHITMAN & BARNES MFG. COMPANY, 111 Chambers street, New York, have prepared for distribution a series of five cards, 6 x 3½ inches, printed on one side, calling attention to their lines of Wrenches, Twist Drills, Spring Keys and Cotters, Drop Forgings of iron, steel, copper and aluminum, agricultural implement parts, &c. On the reverse side are unique illustrations of a suggestive character likely to attract attention. The picture in connection with Twist Drills, for example, suggests Mephistopheles, while the Brownies are worked in with Acme and Regular Wrenches and Mower Knives. Two bull dogs guard their Twin Bull Dog Wrench.

A HARDWAREMAN of Iowa is looking for a stock worth about \$3000 in a well located town in that State. Our correspondent advises us that if he can secure a suitable stock he will pay cash for it and take possession at once.

THE MANUFACTURERS' EXPORT AGENCY, 73 Pearl street, New York, have been made the export representatives in this city of Schulte, Lohoff & Co., Evansville, Ind. This firm manufacture a large assortment of Edge Tools, including Hatchets, Hammers, Adzes, Butchers' Cleavers, Tinners' Snips, &c. A complete line of samples can be seen at the New York warehouses and lowest obtainable prices quoted. C. K. Turner, the manager, for 28 years with the Coombs, Crosby & Eddy Company, most of that period as general buyer, solicits only the trade of the commission houses in the foreign trade, accepting no direct business from abroad.

H. J. BRAINERD has established himself as general buyer and broker and dealer in Hardware Specialties at 81 Reade street, New York. He will execute orders for near by and out of town merchants, in Hardware and kindred goods, accepting a commission, which will be paid by the concern ordering the goods. Mr. Brainerd was for 12 years Eastern agent for the Payson Mfg. Company, Chicago, of which he is still a stockholder and director. While with them he traveled the entire United States, including the Pacific Coast. Purchases will be filled and shipped direct to customers. He is also in a position to accept a few agencies in desirable Hardware Specialties.

ARRANGEMENTS have been completed by which W. W. Pryor & Co., 81 Chambers street, New York, will represent John Stortz & Son of Philadelphia as agents in New York, New Jersey and the New England States. Messrs. Stortz & Son manufacture lines of Tools for mechanics, plumbers, tin-smiths, painters, weavers, cigar makers, butchers, upholsterers, besides many Hardware and House Furnish-

ing Specialties, including Oyster, Bread, Cheese, Farrier and Butcher Knives, Box Hooks and Scrapers, Calking Irons, &c.

Price-Lists, Circulars, &c.

SARGENT & CO., New York: Carriage and Harness Hardware. A catalogue and price-list illustrates a large variety of goods in these lines. It is well arranged and accompanied by a discount sheet.

THE MALLORY-WHEELER COMPANY, New Haven, Conn., and 64 Reade street, New York: Padlocks. The company issue a pocket catalogue of these goods, all illustrations of which are half size. The book shows the entire line of Padlocks made by the company, also Padlock Keys of malleable iron, flat steel and brass. Accompanying the catalogue is a price-list of these goods containing list prices and discounts. The books are issued under date of January 1, 1895.

P. A. FINAN MACHINERY COMPANY, St. Louis, Mo.: Wood and Iron Working Machinery. An illustrated price-list shows Planer and Matcher, Four-Side Molder, Band Saw Machine, Swing Saw, Tenoner, Mortiser, Automatic Knife Grinder, Wood Pulleys, Band and Circular Saws, Belting, &c.

J. B. MILLER & Co., Washington, Pa.: The Genuine Miller Hand Made Grain Cradle. The company state that they have had over 50 years' practical experience in the manufacture of Grain Cradles, and allude to the quality of their goods.

VICTOR MFG. COMPANY, Newburyport, Mass.: Victor Balanced Standard Fire Door. A circular illustrates the door, which is closed automatically by heat, also the construction of the door, and the Victor Roller Bushed Hanger used in connection with the door. The circular gives full information regarding the construction of the door, application of the trimmings, and a list of offices where models with full size standard fire door trimmings can be seen.

D. R. SPERRY & Co., Batavia, Ill.: Hollow Ware, Caldrons, Sugar Kettles, Steam Kettles, Farm Boilers, Drug Mortars, &c. The company's twenty-sixth annual price-list illustrates with prices the entire line of goods made. It is stated that the capacity of the Sugar Kettles, Caldrons and Farm Boilers is given at exactly what they will hold and not at an approximate measure.

WILEY & RUSSELL MFG. COMPANY, Greenfield, Mass.: New Green River Drilling Machine. A circular, Supplement No. 4, represents the Drilling Machine as having a quick return, ball bearings, self regulation friction feed, swing table and as enabling the operator to drill and reverse with one hand without taking it from the crank.

J. J. WARREN COMPANY, Worcester, Mass.: Fine Leather and Canvas Goods. Illustrations are given, with prices and descriptions, of Advertising Novelties, Bill and Collectors' Books, Bag and Trunk Handles, Collar and Cuff Boxes, Dressing and Drinking Glass Cases, Leather and Canvas Dress Suit Cases, Revolving Coin Purse, Canvas Extension Cases, Sample Cases, Handkerchief, Glove and Lunch Boxes, Manicure and Medicine Cases, Bicycle Saddle Leathers, Bicycle Tool Bags, Sword Cases, Cartridge Belts, Bicycle Belt Purses, &c.

F. E. MYERS & BROTHER, Ashland, Ohio: Myers' Spray Pumps. A catalogue devoted to this line of goods illustrates pumps in a variety of styles, including Barrel Spray Pumps, Hy-

draulic, Bucket and Knapsack Spray Pumps, and a Galvanized Tank for use in connection with the Bucket Spray Pump.

APPLETON MFG. COMPANY, Philadelphia, Pa.: Grinders. An illustrated circular shows the Challenge Universal Grinder, Challenge Emery Grinder, Challenge Polishing and Buffing Machine, and Challenge Emery Wheel Dresser.

WINCHESTER REPEATING ARMS COMPANY, New Haven, Conn.: Repeating Rifles, Shot Guns and Metallic Ammunition. Catalogue No. 53, under date of November, 1894, containing 111 pages, illustrates, with prices and descriptions, Rifles, Cartridges adopted to their various models of Rifles, Sights, Shot Guns, Rim and Central Fire Cartridges, Reloading Tools, Shot Shells, Wads, &c. Attention is directed to their Repeating Rifle, model 1894; Smokeless Powder Cartridges, 25-25 Stevens' Cartridge Primers for Nitro Powders and 16-gauge Paper Shot Shells for Smokeless Powders.

E. J. HUSSEY & Co., 80 John street, New York: Hardware Novelties. A booklet calls attention to the fact that the business of the company is the introduction of Novelties. Illustrations are given of the Blount Door Check and Spring, Empire Door Holder and the Harper Door Holder. Attention is also directed to the Bicycle Step Ladder as suitable for use in stores and factories.

SOUTHERN AGRICULTURAL WORKS, Atlanta, Ga.: Atlanta Plows. An illustrated catalogue and price list shows Steel, Cast and Chilled Plows, Double Shovels, Cultivators, Harrows, Cotton Planters, Steel Blades, Single-trees, Single and Double Stocks, &c.

ALLENTOWN HARDWARE WORKS, Allentown, Pa.: Surface Refrigerator Locks and Hinges. A supplementary illustrated catalogue shows a line of Refrigerator Surface Trimmings in ornamental designs, including Locks, Hinges and Flaps. The goods are furnished in real bronze and in antique copper and brass. The company state that they manufacture all kinds of Mortise and Surface Refrigerator Locks, Knobs, Hinges, Name Plates, Castors, in all the latest designs and finishes.

It Is Reported—

Arkansas.

That E. P. Zachery, dealer in Hardware and Stoves, LACEY, has been succeeded by Sherwood Baker.

Colorado.

That the Hardware store of Frank Mann, BURLINGTON, was burglarized a short time since, the booty secured being valued at over \$300.

Connecticut.

That W. E. Gates' Hardware store, at GLASTONBURY, was recently damaged by fire. Loss, \$6000; insurance, \$4000.

Florida.

That L. B. Lee & Co. are a new Hardware firm at TAMPA.

Georgia.

That the Fitten-Thompson's Hardware Company, ATLANTA, have opened a new store corner Broad and Marietta streets.

Illinois.

That B. E. and R. L. Hixson have incorporated the Hixson Hardware Company, QUINCY. The company have a capital stock of \$12,000 paid in. The following are the officers: R. L. Hixson, president; W. C. Ellis, vice-president, and B. E. Hixson, vice-president and treasurer.

That Wadsworth Hardware Com-

pany, JACKSONVILLE, successors to Wadsworth & Matheson, whose store was burned out last spring, have completed their new building, which is 20 feet wide by 100 feet long, three stories high.

That Joseph Seelye contemplates putting in a stock of Hardware at HAVANA.

That J. E. Wightman & Son, CHENOA, whose store was destroyed in the conflagration of July 24, which swept away the entire business portion of the town, have taken possession of their new building.

That George and Byron Darling of GREEN VALLEY have purchased the Hardware business of C. M. Kingman of DELEVAN, Mr. Kingman retiring.

That W. H. Peard, METAMORA, will move his Hardware business to larger quarters about the 1st of January.

That I. T. Meneley, ROSSVILLE, who was burned out July 10 last, has resumed business in his new building which has just been completed.

Indiana.

That Hutching Bros.' Hardware store, at KOKOMO, was entered by burglars on the 9th inst. and \$500 worth of property stolen. The thieves have been apprehended.

That L. L. Hodge has sold out his stock of Hardware at MUNCIE.

That Lillard & Hegarty are a new Stove and Tinware firm at MARION.

Iowa.

That Ruffcorn, McCortney & Co. of WELDON have purchased the Hardware stock of T. A. Kingsbury, CRESTON.

That burglars entered the Hardware store of Anton Cortes, at KAMRAR, on the 27th ult., and stole about \$80 worth of Hardware, Cutlery, &c.

That Marshall & Sharp of AUDUBON have sold their Hardware stock to E. A. Rea of CORYDON, and the new firm are now in charge. Mr. Rea is an experienced Hardwareman and conducts stores at CORYDON and CHARITON. The AUDUBON store will be managed by J. R. Dent of CORYDON and John Parnham, one of the employees of the former firm. Messrs. Marshall & Sharp are not as yet settled in their plans for the future and for the present are engaged in closing up the affairs of their former business.

That the Hardware store of Nicoll & Son, GOLDFIELD, was broken into by burglars on the 8th inst. and about \$100 worth of goods taken.

That J. B. Kiel, Hardware merchant, of MONTROSE, has sold his stock to W. C. Andrews.

Kansas.

That Geo. McVey has lately entered the Hardware field, at HURON.

Kentucky.

That the firm of Lockridge & Wilson, MAYFIELD, have been dissolved. The business will be continued by W. A. Lockridge.

Maryland.

That S. L. Lamberd Company, BALTIMORE, have been incorporated by S. Luther Lamberd, James J. Ryan, William E. Quinn, William H. Fricke and William C. Odell. The company will deal in Agricultural Implements. The capital stock is \$20,000.

Massachusetts.

That F. P. Carruth, Hardware merchant, of Orange, will soon open a branch store at GARDNER.

That Sprague & Moore, the new plumbing and Stove firm, at WESTFIELD, are soon to have a novel and attractive store front, unlike anything in the town. It will be of aluminum, thus presenting an especially handsome appearance.

Michigan.

That E. F. Colwell & Son, Hardware merchants, LAKE ODESSA, have been succeeded by Fowlin & Kart.

Nebraska.

That George Stidworthy has sold his interest in the Hardware store of Beck & Stidworthy Company, PIERCE.

New Hampshire.

That L. I. Moore & Son's new Hardware store, at LANCASTER, is nearly finished. It is 190 feet long, four stories high, and is one of the largest stores in New England.

New York.

That the Hardware business of John E. Stowell & Co., ELMIRA, has been purchased by John M. Diven. W. C. Loomis, who has been connected with G. A. Gridley & Co. since his retirement from the firm of Loomis & Gates, will be the general manager of the business.

That the Clark Hardware Company, JAMESTOWN, have purchased the remaining stock of the Johnson Hardware Company, and will incorporate the same in the stock at the Main street store.

North Carolina.

That WINSTON has a new Hardware house, the style of which is Overman & Merriman.

Ohio.

That L. B. Sherwood of PLAIN CITY has purchased the Tin and Stove store of Eshelman & Makley, at NEW CARLISLE.

Pennsylvania.

That John Carney of IRVINGTON is erecting a new Hardware store, 30 x 60 feet.

That I. W. Scott & Co., dealers in Agricultural Implements, 507 Liberty street, PITTSBURGH, have dissolved partnership by mutual consent. The business will hereafter be conducted at the same place by I. W. Scott, under the former name of I. W. Scott & Co., T. M. D. McCoy retiring.

That Wm. Todd, Jr., formerly bookkeeper for Benjamin Quillman, Hardware merchant, of NORRISTOWN, has severed his connection with the firm and accepted the position of assistant postmaster at the NORRISTOWN post office.

South Dakota.

That Sell Bros.' Hardware store, at TRIPP, was burned to the ground on the morning of the 9th inst. Loss, about \$4000; partly covered by insurance.

Tennessee.

That G. W. Parker will continue the Hardware and Stove business of G. W. Parker & Co., NEW BERNE.

Texas.

That C. C. Vawler's Hardware store, at LWONARD, was burglarized on the 31st ult., and \$45 worth of goods carried away.

That W. H. Richardson's Hardware stock, at AUSTIN, was damaged considerably in a fire on the 12th inst. The loss was fully covered by insurance.

That the Western Hardware Company have recently purchased the Hardware stock of T. W. Smith, HOUSTON.

That W. H. Sedberry, recently of Sedberry & Heard, MARSHALL, has sold his interest in that firm, and bought an interest in the Hardware business of W. J. Taylor, at COMMERCE, the firm style becoming Taylor & Sedberry.

Vermont.

That the interior of George H. Tupper's Hardware store, at BETHEL, is undergoing thorough repairs, which when completed will give the store a very attractive appearance.

Wisconsin.

That the Edgerton Hardware Company, of EDGERTON, have been incorporated. The incorporators are E. W. Lowell, Frank W. Douglass, J. W. Lindley and W. F. Harvey. The capital stock of the company is \$2000.

That F. A. McKillips, in the Hardware and Implement business at AR-

LINGTON, has been succeeded by McKillips & Bissell.

The Hardware trade throughout the country are requested to report business changes, improvements and other matters of trade interest suitable for mention in this department.

Paints and Colors.

It should be understood that the prices quoted in this column are strictly those current in the wholesale market, and that higher prices are paid for retail lots. The quality of goods frequently necessitates a considerable range of prices.

White Lead.—Only fractional changes in prices have taken place, and the general situation of the market is much the same at the present time as it was a week ago. Foreign competition, more particularly in Lead in Oil, is keen enough to have some bearing, and the rivalry between combine and independent American producers is also keen. However, prices have not been forced any lower and the market shows as good tone as could be expected under the circumstances. Dealings have been almost wholly of routine type and merely of average volume for the season.

Red Lead.—Foreign brands are offered quite freely, and it is asserted that business has been done at as low as 5¼¢ for future deliveries, laid down here, against 5½¢@5¾¢, laid down here, for domestic. With discount off the latter is quite as low as the foreign product. Business is rather backward, however, and the market shows weakish undertone.

Litharge.—In the low grades there is quite a good trade, part in the way of filling new orders and part in execution of contracts placed conditionally some time ago. The movement was chiefly in low grade product, valued at about 4¼¢@4½¢, with German brands at the inside figures. High grades have met with merely routine sale and show no important movement in price.

Orange Mineral.—Quite a good business in French has been effected at or about 8¼¢ for January delivery. German has found liberal sale also at 6½¢ or thereabouts for future shipment. In domestic product there has been hardly the average trade but prices are well maintained.

Zincs.—New orders for American oxide come in slowly and they are chiefly for comparatively moderate quantities, with contracts rare for deliveries further ahead than January. Prices are a trifle ragged but without decided change. Foreign brands are unchanged in price and meet with hardly the average sale.

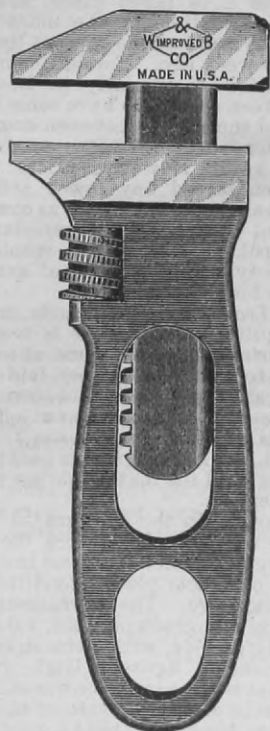
Colors.—Owing to the enhanced cost of base material prices for Quicksilver Vermilion have been raised to 58¢ @ 59¢ for round lots, and proportionately for jobbing quantities. In other dry colors no changes of importance have taken place. Merely ordinary business has been effected. Oil Colors have moved out very fairly in a jobbing way, as have various lines of Mixed Paints, prices for the most of which remain almost stationary.

Oils and Turpentine.

Linseed Oil.—Very little change in prices has taken place, and the market appears to be unusually clear of weak spots, in this quarter at least. Hardly as favorable report can be made on the condition of affairs in Western centers. Competition there is quite keen, and some crushers are said to have made offers very recently at prices close to the cost of production. In this vicinity a fair average business has been done, but the movement is not above the average for the season.

Cotton Seed Oils.—Quite liberal purchases have been made by large Western consumers. Exporters have also manifested livelier interest. Some speculative spirit has also developed. Between them, the various buyers have taken up enough Oil to give the market better tone, and the market is firmer, superficially at least, than it was a week ago. Late sales were on the basis of 25¢ for prime crude and 29¢ @ 30¢ for prime Summer Yellow, with other grades at corresponding prices.

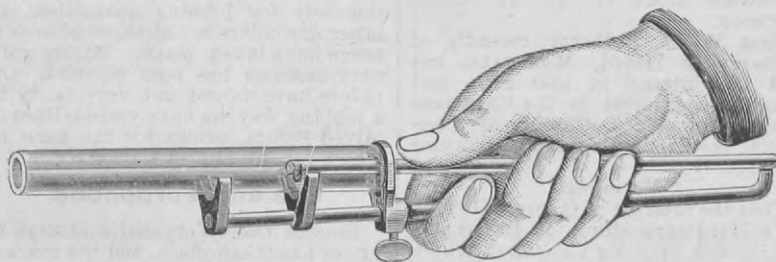
Lard Oil.—A better business has been done and the market shows firmer tone. Pressers are asking about 2¢ advance on late prices and secure part of



Improved Bicycle Wrench.

it. Sales have been fair but not above the average and the real strength of the market remains to be determined. Doubtless a great deal depends upon values for crude material which at present are extremely uncertain.

Fish Oils.—No important movement has taken place in Crude Sperm, Whale or Menhaden Oils, and prices are generally nominal, although superficially firm. In the pressed and bleached products about the usual jobbing trade passes, and prices show nothing more than ordinary variation.



The W. & C. Gauge Glass Cutter.

Spirits Turpentine.—The movement in prices has been very moderate and will not exceed 1½¢ per gallon for the entire week. Dealings have been commonplace in the extreme and the demand spiritless. Late dealings were at 28½¢ @ 29¢, as to style of package.

Improved Bicycle Wrench.

The Whitman & Barnes Mfg. Company, 111 Chambers street, New York, are introducing an improved nickel plated bicycle wrench for high grade machines, as shown herewith. The wrench is described as being made of the highest grade of drop forged steel, and as being strong and as having quick motion. The wrench is 4 inches long, weighs six ounces and the jaw opens 1½ inches. The point is made that the tool is short and compact, and that it can be carried in the vest pocket or in a bicycle tool bag. The wrenches are put up, one each, in a dark colored box, with a brass clasp, which adds to the attractive appearance of the goods.

The Marlin .25-20 Cartridge.

The Marlin Fire Arms Company, New Haven, Conn., are introducing a .25 20 cartridge, as shown in the accompanying cut. The cartridge is loaded with the regular 86 grain bullet, and with F. F. G. powder, and its penetration is referred to as greater than that of the



The Marlin .25-20 Cartridge.

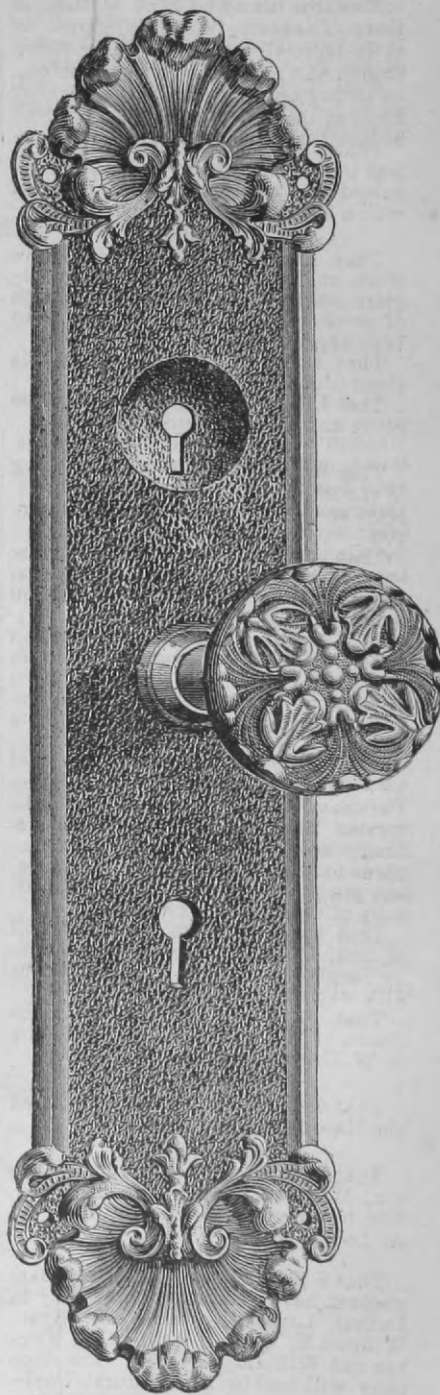
.32 20 cartridge. The cartridge is adapted to use in Marlin repeating rifle, 1894 model, which has recently been illustrated and described in *The Iron Age*. The cartridges, we are advised, are manufactured by the Union Metallic Cartridge Company, and that the Ideal Mfg. Company are prepared to fill orders for reloading tools to reload the cartridges.

The W. & C. Gauge Glass Cutter.

The accompanying cut represents a gauge glass cutter put on the market by Wells & Coutan Company, 29-31 Gold street, New York. The wires of the gauge have at one end a cutting wheel which goes inside the glass tube, and at the other end two fiber rests upon which the tube rests while being cut. A sliding gauge held at any required point by a set screw works upon the lower wire. The points of excellence claimed for the cutter are as follows: That the tool cuts a perfect circle, because the glass

Romanesque Design Knob and Escutcheon.

Mallory-Wheeler Co., 64 Readestreet, New York, are calling the attention of architects and dealers to their Romanesque design in builders' hardware, here shown, recently brought out, and to which we alluded in a previous issue. It can be furnished in front door sets, inside sets, push plates, storm door



Romanesque Design Knob and Escutcheon.

pulls, flush sash lifts, flush bolts, sliding door locks and cups, push buttons, and knobs, in either antique copper, oxidized silver, natural color bronze or statuary bronze finishes. Large buildings can be harmoniously trimmed throughout in this design. The front door sets have concave keyholes, which facilitate the opening of outside doors with latch keys at night.

Miners' California Candlestick.

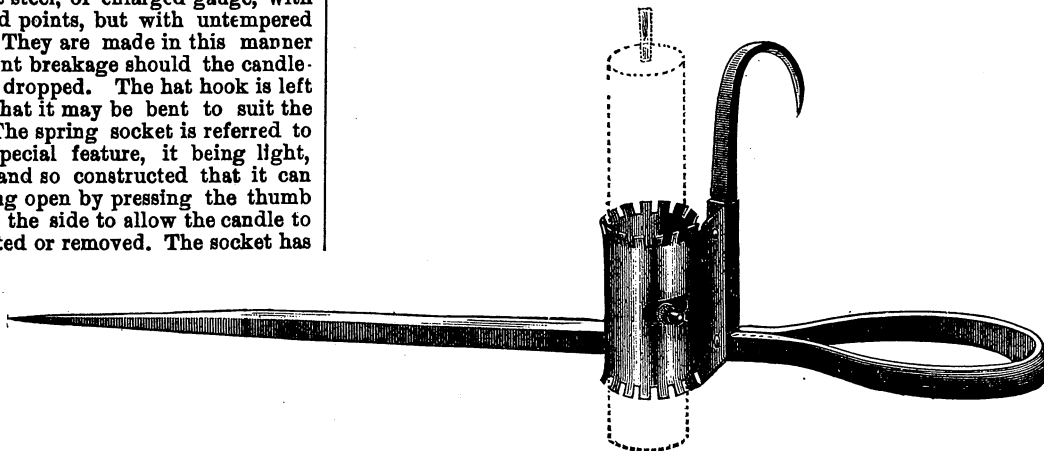
A miners' candlestick embodying novel features is being introduced by the Cleveland Lock Company, Cleveland, Ohio, of which a cut is here shown. The candlestick is described as being made of fine hand forged and wrought steel, of enlarged gauge, with tempered points, but with untempered stock. They are made in this manner to prevent breakage should the candlestick be dropped. The hat hook is left soft so that it may be bent to suit the user. The spring socket is referred to as an especial feature, it being light, strong, and so constructed that it can be sprung open by pressing the thumb knob on the side to allow the candle to be inserted or removed. The socket has

been taken, we are advised, in view of the increased demand for the company's goods from the West.

Improved Perfection Tins.

Sidney Shepard & Co., Buffalo, N. Y., have recently improved their Per-

bers lined with block tin to prevent corrosion. The trimmings are of brass, with a wood handle, and the valves, it is explained, are easy of access. The pump is quadruple acting, with oscillating movement. It is pointed out that the action is easy and direct, with a short stroke, and that it has great effi-



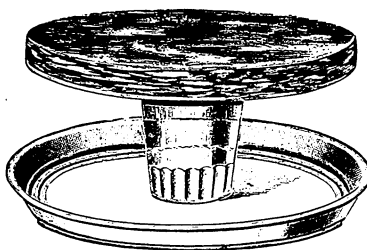
Miners' California Candlestick.

ornamented edges, and is made, it is stated, of the finest spring steel. The hand bow is large and is swaged into a half round shape to suit the hand. Another style of candlestick is made of the same material, and is known as the Lake Superior. It differs from the one shown, in that it has small double-bend hooks. Either style is furnished plain hand forged, japanned, nicked or nicked and engraved.

Priest's Horse or Dog Clipper.

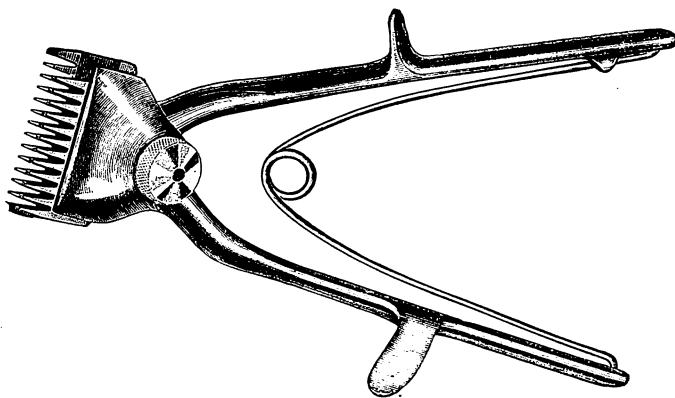
American Shearer Mfg. Company, Nashua, N. H., through their sole agents, Wiebusch & Hilger, 84-86 Chambers street, New York, are offering a one-hand horse or dog clipper, as here shown. While resembling in appearance toilet clippers, the arrangement of teeth, especially, is such as to adapt it to trimming with one hand ears, fetlocks and other places on a

fection tins, which have been on the market for several years. As shown in the accompanying cut, the improvement consists of a patented groove, which the company state overcomes



Improved Perfection Tins.

the objection that the tins, as before made, might leak batter or juice of pies. The illustration shows the cake removed from the tin. The cake is



One Hand Horse or Dog Clipper No. 64.

horse not conveniently reached by larger hand or power clippers. It is also suitable for clipping dogs and other animals. It is referred to as being well made, polished and nicked, and as having a strong, elastic spring.

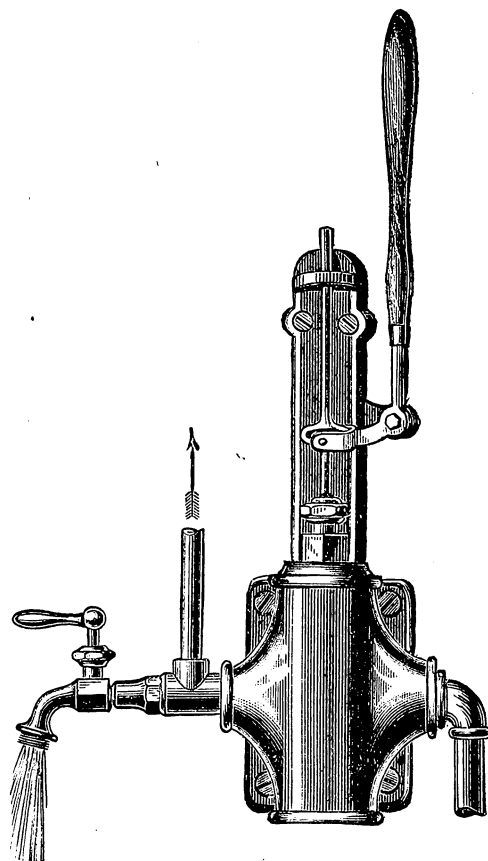
supported on the removal bottom, from which it is easily slid off. The goods are also made square and oblong.

The Mosely Suction and Force Pump.

CRAWFORD MFG. COMPANY, Hagerstown, Md., and 72 Reade street, New York, have established a branch house in St. Louis, the location being 608 North Fourth street. This step has

The Mosely Folding Bath Tub Company, 161 South Canal street, Chicago, Ill., are offering the suction and force pump here shown. The pump has an iron enameled cylinder, with two cham-

ciency for the energy expended. The makers state that the pump, style No. 1, with a 1½ inch suction and ½ inch discharge, has a capacity of 8 gallons per minute, a continuous stream, and that when used in connection with their heater and folding bathtub, either direct or to a supply tank, it is next in convenience to a city water service. It



The Mosely Suction and Force Pump.

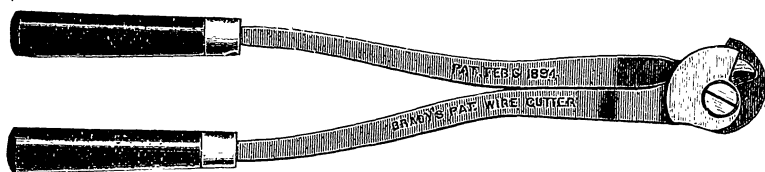
is further stated that the pump is well adapted to forcing water in buildings where the elevation is too great for the pressure from street mains, and also for fire protection.

Brady's Safety Wire Cutter.

The accompanying cut represents a safety wire cutter, put on the market by James Brady, 83 Washington street, Brooklyn, N. Y. The cutter is 24

and convenient receptacle for keeping the dies when not in use. The point is made that these holders permit the user to get the tools into close and awkward places, and that bicycle repair shops and users of small sizes of screw cutting taps and dies will find

there are no chips or shavings left in the pipe to injure valves or faucets. It is easily seen that the shape of this tool adapts it to work close to a wall or ceiling or near a corner. A small pipe can be cut with one hand. The weight of the tool is 1½ pounds, and the length is 15 inches. It is offered for sale by the manufacturer, Robert D. Wardwell, 1359 West Jackson street, Chicago, or by dealers in plumbers' supplies.



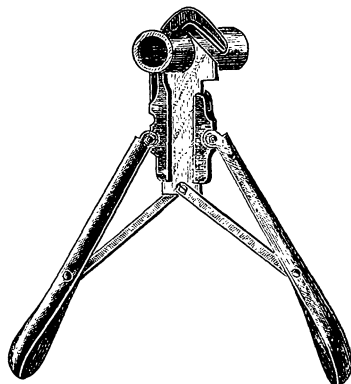
Brady's Safety Wire Cutter.

inches in length over all and is made of steel drop forgings. The handles are 7½ inches in length, made of vulcanized fiber, which, it is remarked, is the best known material for use in cutting live electric wires and cables with safety, as the fiber combines great strength and perfect insulation. It is stated that the cutter blades are drop forged of the best tool steel, and that all parts of the tool are interchangeable, making it always possible to replace broken or worn out parts. The cutter blades are so constructed that as they are ground away in sharpening they can, by means of a series of notches and plugs, be set around one notch at a time. This can be repeated until the blade is used 'up, when a new set of blades may be inserted, thus making the cutter, it is stated, as good as new, as all the other parts of the tool are practically indestructible. The cutters are furnished nickel plated, in antique bronze and forge finish, and are designed for use by fire departments, trolley lines, electric light companies and telegraph companies, for cutting live wires with safety.

the holders practical and convenient. The manufacturers state that they are now prepared to quote prices on these and a large number of improved tools, which appear in their enlarged catalogue, now ready for distribution.

The Simplex Lead Pipe Cutter.

The Simplex lead pipe cutter, which is herewith illustrated, is made with a



The Simplex Lead Pipe Cutter.

blade of tempered steel, ground to a sharp point, with keen edges. The shape of the blade is indicated by a

Tap and Die Holders.

Wells Brothers & Co., Greenfield, Mass., are offering an improved form of tap and die holders, as shown in the



Fig. 1.—Tap Holder.

accompanying cuts. The tap holder, Fig. 1, is provided with a two jawed chuck which, it is stated, holds taps perfectly true. The handle is made of cocobola wood, fully finished, and the top screws off, showing the receptacle

dotted line running across the pipe in the cut. The curved jaw of the frame extends around the pipe while the blade is moved up and down in the slides by the action of the hinged levers between the handles. A slight pressure suffices

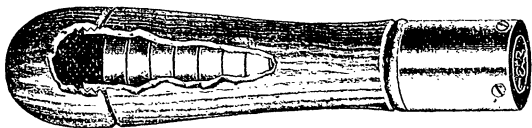


Fig. 2.—Die Holder.

where a number of taps are held while not in use. The die holder, Fig. 2, is made of similar material and is designed to hold ½-inch diameter dies up to and including ¾. The handle holds five dies, the top of which screws off, thus permitting the dies to be dropped out when needed, providing a compact

to puncture the pipe, after which, in the progress of the cut, the blade cuts entirely from the inside outward, as it could not do otherwise owing to its shape. Thus the pipe is not crushed or bent and the ends do not need to be reformed or chamfered. Cutting by such a tool is vastly superior to sawing, as

The G. & J. 1895 Wood Rim Tire.

The illustrations shown herewith represent the new G. & J. 1895 Wood Rim Tire, made by Gormully & Jeffery Company, Chicago. The manufacturers refer

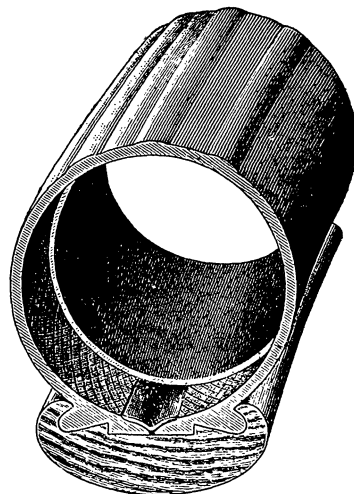


Fig. 1.—The G. & J. 1895 Wood Rim Tire.

to this as an improvement to the G. & J. tire, the improvement consisting in double locking edges, which entirely remove the strain from the outer locking edges of the rim. It also admits of the rim being made smaller and narrower, while retaining its strength. It is explained that the form of "construction of the locking edges of the outer case causes them to act as a buffer, so that if

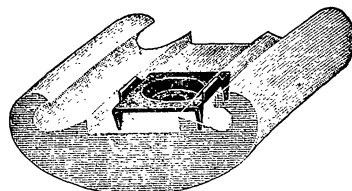


Fig. 2.—Wood Rim, Showing Nipple Washer.

the tire is ridden deflated the probability of injury to the rim is greatly lessened." The point is made that this is a detachable tire not requiring the use of cement or any foreign substance, and that it may be repaired with ease in case of puncture or accident. The makers remark that they have made a wood rim detachable tire heretofore, and that the difficulty has been to produce one of sufficient strength without making the section so large and clumsy; but that by this construction the problem has been solved and overcome. They further remark that this form of tire has been thoroughly tested on the road by experienced riders. Attention is called to the improved nipple washer, Fig. 2, used in the rim, which helps to sustain the strain on the rim itself, and adds to its strength. The fabric used in the construction of the cases, the manufacturers state, is in their opinion the best that can be employed. The company advise us that they are prepared to furnish the tires at once in quantities to manufacturers.

The Fox All Steel Sash Pulley.

The Fox Machine Company, Grand Rapids, Mich., are making an all steel sash pulley, known as style B, and shown in the accompanying illustrations. Fig. 1 shows the manner of driving the pulley in the frame, with the aid of a set, this being designated by the dotted lines. In Fig. 2 are shown the pulley and the mortise required for it, the latter being $\frac{3}{4} \times 2\frac{5}{8}$ inches in size. This pulley is different from the other pulleys placed on the market by the company, as it is designed, the makers state, to be used by manufacturers who are already supplied with sash pulley machinery and who do not wish to make a further investment in tools. It is explained that the pulley fits the mortise made by

solid tool steel, tempered in oil. The reel knives are regulated by the recently patented micrometer adjustment, which is referred to as a most satisfactory regulating contrivance, and as being exact and fine. The ratchet, which is de-

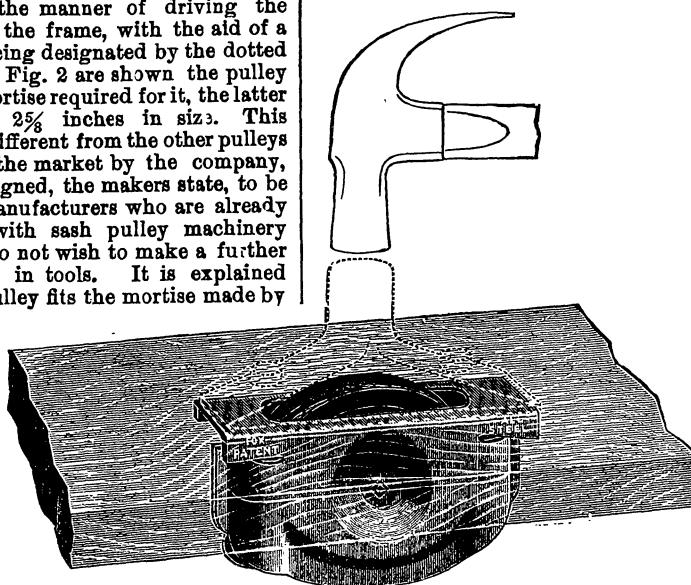


Fig. 1.—The Fox All Steel Sash Pulley, Style B.

standard machines, and that it also retains the valuable features of their other styles of pulleys, lightness and strength. As with the company's other pulleys, no nails or screws are used to fasten in the style B; but as shown in Fig. 1, the four spurs hold it in place. The

scribed as noiseless, is completely housed up to prevent it becoming clogged with dirt or grass. The makers explain that the handle is attached in such a manner that it is adjustable to any height, making it readily available for use by ladies or children, and ren-

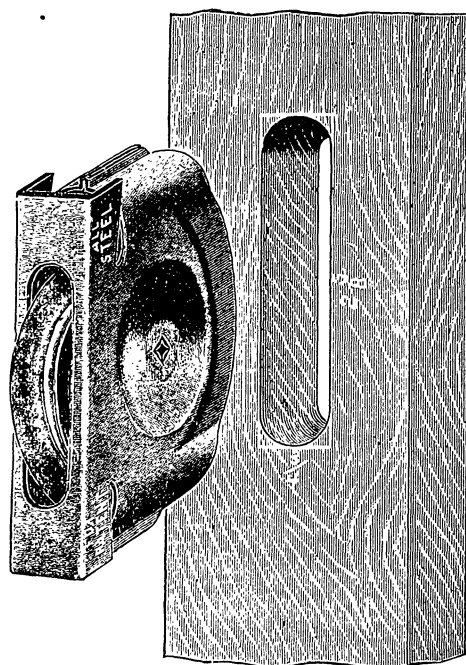


Fig. 2.—Pulley and Mortise.

company think this pulley will become as popular as their corrugated side pulley.

The Improved F. & N. Lawn Mowers.

The lawn mowers manufactured by the F. & N. Mfg. Company, Richmond, Ind., contain important improvements over last season's machines. The old style cutter bar is replaced by one of

dering it effective on terraces and embankments. The machine is provided with an adjustable roller; also a heavy grass attachment, which the manufacturers claim enables it to cut very thick and heavy grass. The reel and shaft bearings are of phosphor bronze, to render the machine light running and to increase its durability. The makers state that the machines, which are handsomely finished, are sent out with an absolute guarantee. The company illustrate the mowers in their advertisement in this issue.

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Current Hardware Prices.

NOVEMBER 21, 1894.

NOTE.—The quotations given below represent Current Hardware Prices, whether made by manufacturers or jobbers. They apply to such quantities of goods as are usually purchased by retail Hardware merchants. Very small orders and broken packages often command higher prices.

The character @ is used to indicate a range of price: thus discount 50 & 10% @ 50 & 10 & 5%, signifies that the goods in question are sold at prices ranging from 50 & 10% to 50 & 10 & 5%.

Adjusters, Blind—

Domestic.....\$ doz \$3.00, 33% @ 33% & 10%
Excelior.....\$ doz \$10.00.....60 & 10 & 2%
Worth's.....\$ doz \$10.00.....list net @ 10%
Zimmerman's—See Fasteners Blind.

Ammunition—See Caps, Cartridges, Shells, &c.

Anvils—

American—
Eagle Anvils, \$ 9.....15 @ 15 & 5%
Horse shoe brand, Wrought.....9 @ 10 & 5%
Barnes Mfg. Co.....50%

Imported—

Armstrong Mouse Hole.....8% @ 9%
B. & H., machine finished.....9% @ 10%
Trenton.....9 @ 9%
Peter Wright's.....9% @ 10% & 5%

Anvil Vise and Drill—

Allen Anvil and Vise \$3.00.....40 & 10%
Cheney Anvil and Vise.....25%
Millers Falls Co., \$18.00.....20%
Holt's.....40 @ 40 & 10%

Apple Parers—See Parers Apple, &c.

Augers and Bits—

Boring Machine Augers.....70 @ 70 & 10%
Car Bits, 12-in. twist.....70 @ 70 & 10%
Common Augers and Bits.....70 @ 70 & 10%
Cincinnati Bell-Hangers Bits.....40%
Forester Pat. Auger Bits.....40%
Jennings' Pattern Car Bits.....40%
Jennings' Pattern Auger Bits.....60%
J. E. Jennings & Co., No. 10, extension
lip.....60%
O. E. Jennings & Co., No. 80.....60%
O. E. Jennings & Co., Auger Bits, set
8 1/2" quarters, No. 5, \$5; No. 80, \$3.50, 25%
Russell Jennings' Augers and Bits 25 & 10%
Lewis' Patent Single twist.....45%
L'Hommedieu Car Bits.....15 @ 10 & 5%
Pugh's Black.....20%
Pugh's Jennings Pattern.....20%
Snell's Bits.....60 & 5 @ 60 & 10%

Bit Stock Drills—

Cleveland.....50 & 10%
Morse Twist Drills.....50 & 10%
New Process Twist Drill Co.....50 & 10%
Standard.....25%
Syracuse, for wood.....40 @ 40 & 10%
Cincinnati, for metal.....50 @ 50 & 10%
Syracuse, for wood (wood list) 30 @ 30 & 10 @ 40

Expansive Bits—

Clark's small, \$18; large, \$26.....40 @ 40 & 5%
Ives' No. 4.....\$ doz \$80.....40 @ 40 & 10%
Speer's, No. 1, \$26; No. 2, \$18.....40 @ 40 & 5%
Stearns' No. 2, \$48.....20%
Swan's.....40 @ 40 & 10%

Gimlet Bits—

See.....25 @ 25 & 10%
Common.....\$ gross \$2.50 @ \$3.00
Diamond.....\$ doz \$1.25.....40 & 10%
Double Cut.....40 & 10%
Hartwell's.....\$ gross \$10.00.....40 & 10%
Douglass's.....40 & 10%
Ives.....60 & 10 @ 60 & 10 & 5%
Shepardson's.....45 & 10 @ 45 & 10 & 5%

Hollow Augers—

Bonney's Adjustable, \$ doz.....\$21.00
Cincinnati Adjustable.....25 @ 10%
Cincinnati Standard.....25 @ 10%
Douglass's.....33% @ 33% & 10%
French, Swift & Co. (Beecher).....33% @ 33% & 10%
Ives'.....33% @ 33% & 10%
Ives' Expansive, each \$4.50.....60 & 5%
Stearns'.....20 & 10%
Universal Expansive, each \$4.50.....20%
Wood's, \$ doz., \$48.....25 & 10%

Ship Augers and Bits—

L'Hommedieu's.....15 @ 10 @ 15 & 10 & 5%
Snell's.....25 @ 25 & 10%
Snell's Ship Auger Pattern Car Bits.....15 @ 10 @ 15 & 10 & 5%
Watrous.....25 @ 25 & 10%

Awl Hafts—See Hafts, Awl.

Awls—

Brad, Handled.....\$ gr. \$2.50 @ \$3.00
Brad, Shoulders.....\$ gr. \$1.30 @ \$1.40
Peg, Pat.....\$ gr. 35 @ 35 & 5%
Peg, Should.....\$ gr. \$1.50 @ \$1.55
Scratch, Handled.....\$ gr. \$4.00 @ \$4.50
Scratch, Socket.....\$ doz. \$1.10 @ \$1.20

Awl and Tool Sets—See Sets, Awl and Tool.

Axes—

First quality, best brands.....\$6.00 @ \$6.50
First quality, other brands.....5.50 @ 6.00
Beveled ad 50% doz.

Axle Grease—See Grease, Axle.

Axles—

No. 1 Common.....3¢
No. 2 Common.....3 1/2¢
Nos. 3 to 14.....70%
Nos. 15 to 18.....47 1/2¢
Nos. 16 to 22.....70 & 5%
Concord, 10 se collar.....44¢
Concord, solid collar.....49¢

Bag Holders—See Holders, Bag.

Balances—

Sash—
Caldwell, low list.....30%
Fullman.....60%
Sensible.....60%

Spring—

Spring Balances.....40 & 10 @ 50%
No. 200.....20
Chatillon, \$ doz.....\$0.80 0.95 1.75 net
Chatillon Straight Balances.....40 @ 40 & 10%
Chatillon Circular Balances.....50 & 10%

Barb Wire—See Wire, Barb.

Bars—

Crow—
Cast Steel.....\$ 2 1/2 @ 3¢
Iron, Steel Points.....\$ 2 1/2 @ 2 3/4¢

Basins, Wash—

Standard Fiberglass, No. 1, 10 1/2-in., \$1.80;
12-inch, \$2.00; 18 1/2-inch, \$2.50.

Beams Scale—

Scale Beams, List Jan. 19, '82.....50 & 10 @ 50 & 10 & 5%
Chatillon's No. 1.....40%
Chatillon's No. 2.....50 & 10 @ 50 & 10 & 5%
Custers', doz. lots.....33%

Beaters—

Egg—
Bryant's.....\$ gross \$14.00
Double (H. & R. Mfg. Co.), \$ gross, No. 0
\$12.00; No. 1, \$15.00; No. 2.....\$36.00
Dover.....\$ doz \$1.00; \$ gross, \$10.50
Dover, Ex. Family Size.....\$ doz, \$3.50
Dover (Standard Co.).....\$ doz \$1.00
Duplex (Standard Co.).....\$ doz \$1.00
Duplex Extra Heavy (Standard Co.).....\$ doz \$3.50
Easy (H. & R. Mfg. Co.).....\$ doz \$12.00
Improved Acme (H. & R. Mfg. Co.).....\$ doz \$9.00
Silver & Co.....\$ doz \$4.50
Spiral.....\$ gross \$2.25 @ \$2.50
Triple (H. & R. Mfg. Co.).....\$ gross \$16.50

Culinary—

Keystone, P. D. & Co., Each, No. 1, \$1;
No. 2, \$2.....20%

Bells—

Cow—
Common Wrought.....60 & 10%
Kentucky Durham.....70 & 10%
Kentucky, Sargent's list.....70 & 10%
Kentucky, "Star".....20 & 10%
Texas Star.....50 & 10 @ 50 & 10%
Western, Sargent's list.....70 & 10%

Door—

Crane, Brooks'.....50 & 10 @ 50 & 10%
Crane, Cone's.....10%
Crane, Cone's.....20 & 10%
Gong, Abbe's.....33% @ 10%
Gong, Barton's.....40 & 10 @ 50%
Gong, Yankee.....45 & 10%
Lever, R. & E. Mfg. Co.'s.....50 & 10 @ 50%
Lever, Sargent's.....60 & 10%
Lever, Taylor's Bronzed or Plated.....25 & 10%
Lever, Taylor's Japanned.....25 & 10%
Pull, Brook's.....50 & 10 @ 50%

Electric—

Bigelow & Dowse.....20 @ 20 & 10%
Wollensak's.....20 @ 20 & 10%

Hand—

Extra Heavy Brass.....70%
Light Brass.....70 & 10 @ 70 & 10 & 5%
Silver Chime.....33% @ 10%
White.....70%
Globe Cone's Patent.....25 & 10 @ 35%

Miscellaneous—

Call.....45 @ 50%
Farm Bells.....\$ 2 1/2 @ 3¢
Steel Alloy Church and School Bells.....50%

Bellows—

Blacksmith's.....60 & 10 @ 70%
Hand Bellows.....50 @ 50 & 10%
Molders'.....50 @ 50 & 10%

Belting, Rubber—

Common Standard.....75 & 10 @ 75 & 10 & 5%
Standard.....60 & 10 @ 60 & 10%
N.Y.B. & P. Co., Carbon.....60 & 10 @ 60%
N.Y.B. & P. Co., Double Diamond.....60%
N.Y.B. & P. Co., 1846 Para.....40 & 10%

Bench Stops—See Stops, Bench

Benders and Upsetters, Tire—

Brettell Tire Upsetter, \$15.....45%
Detroit Perfected Tire Bender 15 @ 15 & 10%
Green River Tire Benders and Upsetters.....20%
Stoddard's Lightning Tire Upsetters.....15%

Bits—

Auger, Gimlet, Bit Stock Drills, &c.,
see Augers and Bits.

Bit Holders—See Holders.

Blind Adjusters—See Adjusters, Blind.

Blind Fasteners—See Fasteners, Blind.

Blind Staples—See Staples, Blind.

Blocks—

Cleveland Block Co., Mal. Iron.....50 @ 100 @ 10%
Moore's Novelty, Mal. Iron.....50%
Sure Grip Steel Tackle Blocks.....40 @ 25 @ 10%
See also Machines, Hoisting.

Bolts—

Carriage, Machine, &c.—

Com. list June 10, '84.....80 & 20 @ 80 & 25%
Genuine Eagle, Norway, list Oct. '84.....80 & 5 @ 80 & 10%
Eagle, Norway, list Oct. '84.....80 & 10 @ 80 & 15%
Phila. pattern, list Oct. 7, '84.....80%
R.B. & W., old list.....70%
Bolt Ends, list Jan. 1, 1890.....80 & 20 @ 80 & 25%
Machine, list Jan. 1, 1890.....80 & 25%

Door and Shutter—

Cast Iron Barrel Square, &c.....75 & 10 @ 75 & 10 & 5%
Cast Iron Chain (Sargent's list).....65 & 10 @ 65 & 10 & 5%
Cast Iron Shutter Bolts.....75 & 10 @ 75 & 10 & 5%
Ives' Patent Door.....60 & 10 @ 60 & 10 & 10%
Wrought Barrel.....75 & 10 @ 80%
Wrt B. K. Flush Common.....60 & 10 @ 60 & 10 & 10%
Wrt Shutter, Sargent's Knob.....50 & 10 @ 60%
Wrt Shutter, Brass's list.....60% @ 70%
Wrt Shutter, all Iron, Stanley's.....60% @ 70%
Wrought Square.....75 & 10 @ 80%
Wrt Sunk Flush, Sargent's list.....60 & 10%
Wrt Sunk Flush, Stanley's list.....60 @ 60 & 10%

Stove and Plow—

Flow.....60 & 10 @ 60 & 10 & 10%
Stove.....70 @ 70 & 5%
R. B. & W., Plow.....65%

Tire—

Common, list Feb. 28, '83.....70 & 10%
American Screw Company.....70 & 10%
Norway, Phila., list Oct. 16, '84.....75 & 10%
Eagle, Phila., list Oct. 16, '84.....80 & 10%
Bay State, list Feb. 28, '83.....70 & 10%
Franklin Moore Co.:
Norway, Phila., list Oct. 16, '84.....75 & 10%
Eagle, Phila., list Oct. 16, '84.....80 & 10%
Kelpise, list Feb. 28, '83.....70 & 10%
Port Chester Bolt and Nut Company
Empire list Feb. 28, '83.....70 & 10%
Keystone, Philadel., list Oct. '84.....80 & 10%
Norway, Phila., list Oct. '84.....75 & 10%
R. B. & W., Philadel., list Oct. 16, '84.....85%

Borers, Tap—

Common and Ring.....20 & 10%
Clark's.....35% @ 35%
Enterprise Mfg. Co.....25%
Ives' Tap Borers.....33% @ 35%

Boring Machines—See Machines, Boring.

Bow Pins—See Pins, Bow.

Boxes, Letter—

Tatum's.....40

Boxes, Wagon—

Per doz.....24%

Boxes, Miter.

Spilker's Excelior, 3 in. \$7.50, 4 in.
\$8.50, 5 in. \$15.00, 6 in. \$15.00.....20%

Braces—

NOTE.—Most Braces are sold at net prices.
Barber's.....50 & 10%
Armstrong's.....50 & 5%
Common Ball, American.....\$1.00 @ \$1.10
Davis Patent.....50 & 10%
Fray's Genuine Spofford's.....50 & 10 @ 50%
Fray's Nos. 70 to 120, 81 to 125, 207 to 414.....50 & 10 @ 50%
Ives' New Haven Novelty.....70 @ 70 & 5%
New Haven Ratchet.....60 & 5 @ 60 & 10%
Barber Ratchet.....60 & 5 @ 60 & 10%
Barber's.....60 & 5%
Spofford.....60 & 5 @ 60 & 10%
Z. S. & W. Co., Peck's Patent.....60%
Rose & Johnson.....50%

Brackets—

Shelf, fancy,
Sargent's list.....70 @ 70 & 10%
Other makes at a wide range of prices.
Shelf, plain,
Regular, list.....65 @ 70%
Sargent's list.....60 & 10 @ 70 & 10%
Bradley Shelf Brackets.....75%

Bright Wire Goods—See Wire.

Brollers—

Hens' Self-Inch.....9 10 9 1/2
Basting.....\$ per doz. \$4.50 5.50 6.50
Morgan Odorless.....\$ doz. \$12, 50%
New Haven.....60%
Wire Goods Co.....65 & 10%

Buckets, Well and Fire—

See Pails.

Bull Rings—See Rings, Bull.

Butcher's Cleavers—See Cleavers, Butcher's.

Butts—

Brass—

Cast Brass, Fast.....33 1/4 @ 10%
Cast Brass, Loose Joint.....33 1/4 @ 10%
Cast Brass, Tiebout's.....50%
Wrought Brass.....80 & 10 @ 80 & 20%

Cast Iron—

Fast Joint, Broad.....60 & 10 @ 60 & 10 & 10%
Fast Joint Narrow.....60 @ 60 & 10%

Loose Joint, Japanned.....75 & 10 @ 80%

Loose Joint, Jap. with Acorns.....75 & 10 @ 80%

Loose Pin, Acorns, Japanned.....75 & 10 @ 80%

Loose Pin, Acorns, Japanned.....75 & 10 @ 80%

Plated Tips.....75 & 10 @ 80%

Mayer's Hinges.....75 & 10 @ 80%

Parliament Butts.....75 & 10 @ 80%

Fast Joint, Broad.....75 & 10 @ 80%

Fast Joint, Narrow.....75 & 10 @ 80%

Inside Blind, Light.....75 & 10 @ 80%

Inside Blind, Regular.....75 & 10 @ 80%

Loose Joint, Broad.....75 & 10 @ 80%

Loose Pin, Back Flaps, &c.....75 & 10 @ 80%

Banded Wrought Butts.....50 & 10 @ 50 & 10 & 5%

Cages, Bird—

Hendryx Brass:
3000, 5000, 1100 series.....10%
1200 series, 600 and 900 series.....40%
200, 300, 400 and 900 series.....40%
Hendryx Bronze:
700, 800 series.....40 & 10 @ 50%
Hendryx Enameled.....40 & 10 @ 50%

Callipers—See Compasses.

Calks, Toe—

Burke's, One Prong, Blunt.....45 @ 50%
Burke's, One Prong, Sharp.....45 @ 50%
Burke's, Two Prong, Blunt.....45 @ 50%
Burke's, Two Prong, Sharp.....45 @ 50%
Gautier, One Prong, Blunt.....45 @ 50%

CanOpeners—See Openers, Can.

Cans Milk—

S. B. & Co., 5-gal., \$3.00; 8-gal., \$4.40;
10-gal., \$4.75 each.....40 & 10

Cans Oil—

Galvanized Blue Band, 1 gal., \$ doz. \$2.50
Galvanized Blue Band, 5 gal., \$ doz. \$12.00
Galvanized Blue Band, 5 gal., Faucet,
\$ doz., \$5.00

Caps—Percussion—

Eley's E. B.....52 @ 56¢
Hicks & Goldmark's and Union Metallic
Cartridge Co. \$1000

E. B. Grand, Edge, Cent. Fire, 1-10's 47 @ 50¢
E. B. Trimmer, Edge, 1-10's.....47 @ 50¢
F. L. Waterproof, 1-10's.....35 @ 37¢
G. D. G.....27 @ 30¢
Musket, Waterproof, 1-10's.....50 @ 53¢
S. B. Genuine Impres.....45%

Primers—

Berdan Primers, \$1.00.....2%
E. L. Cape (Sturtevant Shells) \$1.00.....2%
All other Primers, \$1.50.....2%

Cards—

Watson's Cotton, Wool, Horse and
File, list January 28, 1891.....10%

Carpet Stretchers—

See Stretchers, Carpet.

Cartridges—

B. B. Caps, Con. Ball, Swgd., \$1.85 @ \$1.90
B. B. Caps, Round Ball.....\$1.60 @ \$1.80
Blank Cartridges, except 22 and 32 cal.,
additional 10% to above discounts.

Blank Cartridges, 22 cal., \$1.75.....25%
Blank Cartridges, 32 cal., \$1.50.....25%
Cent. Fire, Military and Sporting 15 & 25 & 32
Cent. Fire, Pistol and Rifle.....25 & 5 & 32
Primed Shells and Bullets.....15 & 5 & 32
Rim Fire Cartridges.....50 & 5 & 32
Rim Fire Military.....15 & 32

Carpet Sweepers—

See Sweepers, Carpet.

Casters—

Bed.....60 & 10 @ 60 & 10 & 10%
Plate.....60 & 10 @ 6

Chalk Lines—See Lines.

Checks, Door—
 Bardsley's.....20%
 Unity.....50%

Chisels—

Socket Framing and Firmer
 Mr. Ohio Tool Co.....75%100%80%

Chisels—
 Witherby.....30%
 Buck Bros.....30%
 Charles Buck.....30%
 Douglass.....75%75%10%
 L. & J. J. White.....80%30%85%
Tanged and Miscellaneous.
 Buck Bros.....30%
 Charles Buck.....30%
 Butchers.....\$4.75@5.00 to 2
 Spear & Jacksons.....\$5 to 2
 Tanged Filners.....60%40%10%
 L. & J. J. White, Tanged.....25%5%
 Cold Chisels, fair quality, # 2.....14@16%

Chucks—

Beach Pat......each, \$8.00.....20%
 Danbury.....each, \$8.00, 30@30%25%
 Graham Patent.....35%
 Morse's Adjustable, each, \$7.00, 20@20%25%
 Syracuse.....25%
 Skinner Patent Chucks.....40%
 Combination Lathe Chucks.....40%
 Drill Chucks.....35%
 Independent Lathe Chucks.....40%
 Planer Chucks.....20%
 Universal Lathe Chucks.....40%
Union Mfg. Co.
 Combination.....40%
 Independent.....40%
 Universal.....40%
 Victor.....\$8.50, 25%

Churns—

Mademoiselle Star Barrel Churn, each
 6 gal., \$2.60; 10 gal., \$2.75; 15 gal.,
 \$3.00; 20 gal., \$3.25
Tim Union, each, 6 gal. \$3.25; 7 gal.,
 \$3.75; 10 gal., \$4.25.

Clamps—

Adjustable, Cincinnati......25%10%
 Adjustable, Cincinnati.....15%15%25%
 Adjustable, Cincinnati.....15%15%25%
 Barnes' Malleable Screw and Cabinet.....50%
 Barnes' Machinists' Clamps.....35%4%
 Cabinet, Sargent's.....70%10%
 Carpenter's, Cincinnati.....25%10%
 Carriage Makers', P. S. & W. Co.....40%10%
 Carriage Makers', Sargent's.....75%75%25%
 Eberhard Mfg. Co.....40%40%10%
 Joiners' Clamps, Tatum.....25%10%
 R. I. Tool Co.'s Wrought Iron.....25%
 Saw Clamps, See Vises, Saw Filers'
 Stearns' Malleable, with Wrought Iron
 Screw.....75%75%25%
 Stearns' Steel.....40%10%40%10%25%
 Warner's.....40%10%40%10%25%

Cleavers, Butchers—

Beatty's......40%50%40%10%
 Bradley's.....25%30%
 Foster Bros.....30%
 New Haven Edge Tool Co.'s.....40%
 Nichols.....30%
 P. S. & W. Co.'s.....35%40%30%40%10%
 Schulte, Lohoff & Co.....40%40%25%
 L. & J. J. White.....25%

Clips—

Baker Axle Clips......25%10%
 Norway, Axle.....70%70%85%
 Norway Spring Bar Clips. 60%10%10%70%
 24 grade Norway Axle.....70%50%70%10%
 Steel Felloe Clips.....70%40%4%
 Superior Axle Clips.....70%40%4%
 Wrought Iron Felloe Clips, # 2, 4, 6, 8, 10, 12.....40%40%4%

Cloth and Netting, Wire—

See Wire, &c.

Cockeyes—

Cocks Brass—
 Hardware List (Globe, Kerosene, Lever
 Bibbs, Racking, &c.).....60%25%60%10%

Coffee Mills—See Mills, Coffee.**Collars Dog—**

Brass, Pope & Stevens' list......40%
 Chapman Mfg. Company, New list.....40%
 Embossed, G. F. Pope & Stevens' list.....30%40%
 Leather, Pope & Stevens' list.....40%
 Medford Fancy Goods Co.....40%10%60%

Combs Curry—

American Curry Comb Co......33%40%
 Fitch's.....50%10%60%10%10%
 Gibb's Magnetic.....\$ doz., \$2.00
 Kohler's Human.....\$ doz., \$1.75
 Kohler's Magic Oscillating.....\$ doz., \$2.00
 Rubber, per doz., \$7.50.....20%

Compasses, Dividers &c.

Compasses, Callipers, Dividers. 70%10%75%
 Bennis & Call Co.'s
 Dividers.....65%
 Callipers, Call's Patent Inside.....55%
 Callipers, Double.....65%
 Callipers, Inside or Outside.....65%
 Callipers, Wing.....65%
 Compasses.....50%25%
 Excelsior.....50%50%
 Starrett's
 Combination Dividers.....25%
 Lock Callipers and Dividers.....25%
 Spring Callipers and Dividers.....25%10%
 Stevens & Co.'s.....25%10%

Coolers, Water—

S. B. & Co.: 2-gal., \$3.40; 3-gal., \$4.00;
 4-gal., \$4.50; 6-gal., \$5.00 each.....60%

Coopers' Tools—

See Tools, Coopers'.

Cord Sash—

Braided, Crown Drab and Fancy, #
 B, 50%.....30%
 Braided, Crown White, # B, 50%.....50%
 Cable Laid Italian Sash.....\$ 12@20%
 Common.....\$ 12@15%
 Common Russia Sash.....\$ 12@15%
 Egyptian, India Hemp, Braided.....20%
 India Cable Laid Sash.....\$ 11@12%
 Massachusetts, White.....21@22%
Omaha Mills
 Crown, Solid Braided White, # B, 22%
 Crown, Drab and Fancy.....\$ 2, 22%
 Braided Giant, Drab and Fancy, # B, 30%
 Braided, Giant, White.....\$ 2, 20%
 Patent, good quality.....\$ 10@11%
 Patent Russia Sash.....\$ 18@14%
Samson
 Braided, Drab Cotton.....\$ 4, 42%
 Braided, Italian Hemp.....\$ 4, 42%
 Braided, Linen.....\$ 4, 50%
 Braided, White Cotton.....\$ 4, 37%
 Semper Idem, Braided, White.....20%
Silver Lake
 A quality, Drab, 50%.....25%
 A quality, White, 50%.....25%
 A quality, Drab, 30%.....10%
 B quality, White, 30%.....10%
 Sylvan Spring, Extra Braided, Drab, 30%
 Sylvan Spring, Extra Braided, White, 34%

Tate's Solid Braided—
 Economy Drab.....\$ 2, 27%
 Economy, White.....\$ 2, 28%
 Hercules, Drab.....\$ 2, 28%
 Hercules, White.....\$ 2, 28%
 White Cotton Braided, fair.....\$ 2, 25%24%

Wire Picture—
 Braided or Twisted.....80%10@80%20%

Corkscrews—See Screws, Cork.

Corn Knives and Cutters
 See Knives, Corn.

Crackers, Nut—

Acme.
 Japanned, # gro., \$30.....50%
 Nickel Plated, # gro., \$30.....37%
 Fancy Nickel Plated, # gro., \$30.....40%
 Table (H. & B. Mfg. Co.).....50%
 Turner & Seymour Mfg. Co.....50%

Cradles—

Grain.....50%25@50%5%25%

Crays—

White Crays, # gross.....60%6%
 Cases, 100 gr., \$3.75@4.25, at factory.
D. M. Steward Mfg. Co.
 Metal Workers' # gross, \$2.50, 20@25%
 Railroad, # gross, 2.00, 20@25%
 Rolling Mill, # gross, 2.50, 20@25%
 Soapstone Pencils, # gross, 1.50, 20@25%
 See also Chalk.

Creamery Pails—See Pails, Creamery.

Crow Bars—See Bars, Crow.

Curry Combs—

See Combs, Curry.

Cutters—Meat—

American......\$ doz., \$3.00
 No. 1.....\$5 \$7 \$10 \$25 \$50 \$80
 Enterprise.....10 12 22 32 42
 Nos.....\$3 \$2.50 \$4 \$6 \$15
 Dixon's, # doz.....40%40%25%
 Nos.....1 2 3 4 5 6 7 8 9 10
 Draw Cut, each.....\$14.00 \$17.00 \$19.00 \$30.00
 Nos. 5 6 7 8 9 10.....\$50 \$75 \$80 \$225.....20@25%
 Hale's, # doz.....\$27.00 \$30.00 \$45.00
 Nos.....11 12 13 14 15 16 17 18 19 20
 Home No. 1, # doz.....\$27.00 \$30.00 \$45.00
 Little Giant, # doz.....\$27.00 \$30.00 \$45.00
 Nos. 305 310 312 320 322
 \$35.00 \$48.00 \$44.00 \$72.00 \$68.00
 Miles' Challenge, # doz.....\$45@55@10%
 Nos.....1 2 3 4 5 6 7 8 9 10
 Triumph No. 505, # doz.....\$22.00 \$30.00 \$40.00
 Woodruff's, # doz.....\$40@40%25%
 Nos.....100 150 180
 Chadborn's Smoked Beef Cutter, # doz.....\$60.00
 Enterprise Beef Shavers.....20%

Tucker & Dorsey Mfg. Co.: 40%

Kraut Cutters, 1 Knife, # gross.....\$21.00

Slaw Cutters, 2 Knife, # gross.....\$30.00

Tobacco

Acme......\$ doz., \$20.00, \$40.00
 All Iron.....\$ doz., \$4.00
 Champion.....\$ doz., \$20.00, \$20%10%
 National Co.'s, # doz., \$18.00, \$20%10%
 National.....\$ doz., \$21.00, \$20%10%
 Sargent's.....\$ doz., \$24.00, \$20%10%

Washer

Appleton's......\$ doz., \$18.00
 60%10@60%10%10%
 Bonney's, # doz., \$8.50.....50@60%5%
 Cincinnati.....\$ doz., \$11.00, \$9%5%
 Johnson's, # doz., \$11.00, \$9%5%
 Penny's, # doz., \$11.00, \$9%5%
 Smith's, # doz., \$11.00, \$9%5%
 Tatum's.....\$ doz., \$12.00, \$20%10%10%

Diggers, Post Hole, &c.—

Eureka Diggers......\$ doz., \$11.00
 Fletcher Post Hole Augers, # doz., \$38.00
 Johnson's.....\$ doz., \$20%10%
 Gem, Improved.....\$ doz., \$8.50@9%0%
 Gibbs' Columbia.....\$ doz., \$12.00
 Gibbs' Hustler.....\$ doz., \$10.00
 Gibbs' Imperial.....\$ doz., \$7.50
 Gibbs' National.....\$ doz., \$12.00
 Gibbs' Post Hole Digger.....\$ doz., \$12.75
 Kohler's Hercules.....\$ doz., \$12.00
 Kohler's Invinible.....\$ doz., \$10.00
 Kohler's Little Giant.....\$ doz., \$15.00
 Kohler's Champion.....\$ doz., \$7.50
 Kohler's Pioneer.....\$ doz., \$9.00
 Ryan's.....\$ doz., \$18.00
 Samson, # doz., \$34.00.....25@25%10%
 Universal.....\$ doz., \$15.00
 Shimer's Hollow Handle.....\$ doz., \$24.00
 Vaughan's Post Hole Auger, # doz., \$8.50@9%0%

Dividers—See Compasses.

Dog Collars—See Collars, Dog.

Door Checks—

See Checks, Door.

Door Springs—

See Springs, Door.

Drawers, Money—

Money Drawers, # doz.....\$18@20
 Wadell's Improved, No. 1, # doz., \$15.00
 Wadell's Improved No. 2, # doz., \$18.00
 Wadell's Comb, Cutlery Case and
 Alarm Tilt.....\$12.50

Drawing Knives

See Knives, Drawing.

Drills and Drill Stocks—

Automatic Boring Tools......\$1.75@1.85
 Bench Drills, Stearns'.....50%
 Blacksmiths'.....each \$1.75
 Blacksmiths' Self-Feeding, each \$7.50, 20%
 Breast, Bartholomew's, No. 14, # doz.....\$18.00
 Breast, Millers Falls.....each \$30.00, 25%
 Breast, P. S. & W.....\$ 2, 22%
 Breast, Wilson's.....30%25%
 Chloopee Automatic Drill.....20%10%
 Goodell Automatic Drills.....40%50%40%10%
 Hatchet, Curtis & Curtis.....35%
 Hatchet, Ingersoll's.....25%
 Hatchet, Merrill's.....20%20%25%
 Hatchet, Moore's Triple Action.....20%20%25%
 Hatchet, Parker's.....20%20%25%
 Hatchet, Weston's.....20%20%25%
 Hatchet, Whitney's.....20%20%25%
 Whitney's Hand Drill, Plain, \$11.00;
 Adjustable, \$12.00.....20%10%

Twist Drills—

Cleveland.
 Diamond, # B.....50%10%
 Graham's Pat. Groove Shank.....50%0%
 Morse.....25%

New Process
 Standard.....0%10%5%
 Syracuse (Metal List).....60%5%

Drill Bits or Bit Stock

Drills—See Augers and Bits.

Drill Chucks—See Chucks.

Dripping Pans—
 See Pans, Dripping.

Drivers, Screw—

Allard's Spiral......50%
 Buck Bros' Screw Drivers.....25%10%
 Buck Bros' Screw Driver Bits.....27%25%
 Clark's Pat.....35%40%
 Cincinnati.....25%10%
 Champion.....50%40%10%
 Dixon's.....50%40%10%
 Electric Spiral.....50%
 Ellich's Socket and Hatchet.....40%10%
 Fray's Hol. H'dle Sets, No. 8, \$12.00, 45%
 Gay & Parsons.....35%
 Jones' Automatic.....50%50%25%
 Jones Reversible.....60%
 Knapp & Cowles.....40%
 No. 1.....70%10%
 No. 2.....70%10%
 No. 3.....60%10%
 No. 4 and 00, Acme and Ideal.....60%10%
 Kolb's Common Sense, # doz., \$8.00.....25%10%

Mayhew's Black Handle......50%
 Mayhew's Monarch.....45%10%
 New York, Manhattan & Handy.....20%
 P. S. & W.....70%
 Sargent & Co.'s.....80%10%10%
 No. 1, 2, 3, 4 and 00.....60%10%10%
 Screw Driver Bits, Farr's, # gross, \$6.25
 Screw Driver Bits.....\$ doz., \$60%75%
 Stanley R. & L. Co.'s.....65%10%
 No. 64, Varished Handles.....70%10%
 Stearns'.....25%10%25%
 Syracuse Screw Driver Bits.....30%30%25%
 C. T. Williamson Wire Novelty Co.....50%

Egg Beaters—See Beaters, Egg.

Egg Poachers—

See Poachers, Egg.

Electric Bell Sets—
 See Bells, Electric.

Emery—No. 4 to No. 54 to Flour, OF

48 gr. 160 gr. F.F.F.

Kegs, # doz......\$ 4 5 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72 74 76 78 80 82 84 86 88 90 92 94 96 98 100

10-b cans, 10.....\$ 4 5 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72 74 76 78 80 82 84 86 88 90 92 94 96 98 100

10-b cans, less.....\$ 4 5 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72 74 76 78 80 82 84 86 88 90 92 94 96 98 100

than 10-b.....\$ 4 5 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72 74 76 78 80 82 84 86 88 90 92 94 96 98 100

Enameled and Tinned Ware—See Ware, Hollow.

Escutcheon Pins—
 See Pins, Escutcheon.

Escutcheons—
 Brass Thread.....60%60%10%
 Door Lock.....Same dis. as Door Locks.
 Wood.....25%

Expanded Metal—
 List No. 5.

Door Mats, Galvanized......25%

Fencing, Painted Sheets......20%

Latting, Painted Sheets......10%

Netting, Painted Sheets......10%

Tree Guards, Painted......15%

Window Guards, Painted......15%

Extractors, Lemon Juice—
 See Squeezers, Lemon.

Fasteners Blind—

Austin & Eddy, # gr. sets......\$5.50

Mackrell's, # doz., \$1.00......20@20%10%

Security Gravity......\$ gr., \$7.50

Van Dine's Old Pat., \$15 # gr......55%10%

Van Dine's Screw Pat., \$15 # gr......60%10%

Zimmerman's......50%

Faucets—
 B. & L. B. Co.
 West's Lock, Open and Shut Key.....50%
 Burnside's Red Cedar.....50%
 Burnside's Red Cedar, bbl. lots.....50%10%
 Carl Lined.....70%25%70%10%
 Fenn's.....40%
 Fenn's Cork Stops.....35%
 Frary's Pat. Petroleum.....60%10%
 Metallic Key, Leather Lined.....60%10%
 National Measuring, # doz., \$38.00, 25%10%

John Sommers
 Perfect Best Block Tin Key.....40%
 IXL, 1st quality, Cork Lined.....50%
 Diamond Lock.....50%
 Perfection, Fla. Red Cedar (in boxes).....40%
 Boss Metallic Key.....60%
 Reliable Cork Lined.....60%
 C. E. Western Pattern Cork Lined.....50%
 No Brand, Red Cedar (in bbls.).....50%10%
 Western Pattern Metal Key.....40%
 No Brand Metal Key.....60%

Self Measuring
 Enterprise, # doz., \$36.00.....33%4%
 Lane's # doz., \$36.00.....25%10%
 Star.....60%
 Star, Metal Plug, new list.....40%
 Lockport, Metal Plug, reduced list.....60%

Feloe Plates—
 See Plates, Feloe.

Fibre Ware—See Ware, Fibre.

Fifth Wheels—

Brewster's......50%25%
 Derby and Cincinnati.....45%25%

Files—
 Domestic.....70%70%10%
 Arcade.....60%10%10%70%
 G. & H. Barnett (Black Diamond).....60%10%10%70%
 Eagle.....60%10%10%70%
 Nicholson Files, Rasps, &c. 60%10%10%
 Nicholson (X.F.) Files.....70%
 Nicholson's Royal Files (Seconds).....75%
 (extra prices on certain sizes.)
 Other makers, best brands.....70%50%70%10%
 Fair brands.....75%75%25%
 Second quality.....80%80%10%
 Axed Horse Rasps.....80%10%50%
 Chelsea Horse Rasps, Hand Cut.....50%10%
 Heller's Horse Rasps.....60%10%
 McCaffrey's Horse Rasps.....50%10%50%
 Trojan Horse Rasps.....60%10%50%

Imported—
 Stubb's list 75%90%

Fixtures Grindstone—

Moore's......55%10%
 P. S. & W. Co.....50%10%10%
 Reading Hardware Co. 30%10%30%10%10%
 Sargent's Patent.....70%10%70%10%10%

Filing Machines—
 See Machines, Filing.

Fodder Squeezers—
 See Squeezers, Fodder.

Forks—
 Hay, Manure, &c. Asso. List, 70%70%50%
 Hay, Manure, &c., Phila. List, 60%40%10%
 Plated, See Spoons.

Frames—
 Red, Polished and Varished.....\$ doz., \$1.50, 25%

White Vermont......\$ gro., \$9.00@9.50

Screen, Window and Door—
 Bonarda Window Screens.....50%10%
 Cortland.....40%40%25%
 Empire Fancy Screen Doors, # doz.....\$15
 Phillips' Window Screen Frames.....50%10%50%10%50%

Porter's Pat. Window and Door Frame......35%40%25%

Stearns Frames and Corners......25

Sewing, Pat Long \$ doz. \$1.20
Sewing, Pat., Short, \$ doz. 45¢@50¢

Halters—

Covert's Adj. Rope Halters.....40¢@25¢
Covert's Adj. Web Halters.....35¢@50¢
Covert's Hemp Horse and Cattle Tie.....50¢@10¢
Covert's Jute Cattle Ties.....70¢@10¢
Covert's Jute Horse Ties.....70¢@25¢
Covert's Rope, 7-16 in., Jute.....70¢@25¢
Covert's Rope, 1/2 in., Hemp.....85¢@25¢
Covert's Rope, Jute.....60¢@10¢@25¢
Covert's Saddlery Works Halters.....38¢@45¢
Covert's Saddlery Works Handy Web Halters.....38¢@45¢
Covert's Saddlery Works Horse and Cattle Ties.....38¢@45¢

Hammers—

Handled Hammers—
Atha Tool Co.....50¢@10¢@60¢
Humason & Beckley.....50¢@10¢@60¢
Verree.....40¢@10¢
Cheney's Claw.....40¢@10¢
Cheney's Machinist's & Riveting.....50¢@10¢
C. Hammond & Son.....40¢@10¢@50¢
Magnetic Tack, Nos. 1, 2, 3, \$1.25, 1.50 & 1.75.....50¢@10¢
Maydole, 1894 List.....25¢@10¢@40¢
Peck, Stow & Wilcox.....40¢@10¢@50¢
Fayette R. Plumb.....40¢@10¢
Artisan's Choice, A. E. Nail.....40¢@10¢
Engle's and B. S. Hand.....60¢@15¢
Machinist's Hammers.....60¢@10¢
Plain Y. & P. A. E. Nail.....40¢@10¢
Other Nail Hammers.....50¢@10¢
Sargent's.....40¢@10¢@50¢
Warner & Nobles, new list.....25¢@10¢

Heavy Hammers and Sledges—

3 lb and under.....\$1.40
3 to 5 lb.....\$1.80, 80¢@80¢@10¢
Over 5 lb.....\$2.50
Wilkinson's Smiths.....10¢@10¢@40¢

Handcuffs and Leg Irons—

See Police Goods.

Handles—

Cross-Cut Saw Handles—
Atkins.....40¢
Champion.....45¢@45¢@10¢
Ely's Perfection.....\$ doz. \$1.50, 60¢
Sensible.....\$ doz. \$1.50, 60¢

Iron, Wrought or Cast—

Barn Door, \$ doz. \$1.40.....20¢@5¢
Bronze Iron Drop Latches.....\$ doz. \$0.80
Chest, Sargent's List.....50¢@10¢@50¢@10¢
Door or Thumb.....\$ doz. \$1.00, 1.00, 1.00, 1.00, 1.00
Jap'd Store Door Handles—Nuts, \$1.62, Plate, \$1.10; no plate, \$0.88.....10¢
Boggin's Latches.....\$ doz. \$2.50@30¢

Wood—

Auger, assorted.....\$ gr 5.00
Auger, large.....\$ gr 2.75
File, assorted.....\$ gr 2.75
Brad Awl.....\$ gr 2.00
Apple Firmer Chisel, ass'd.....\$ gr 6.00
Apple Firmer Chisel, large.....\$ gr 6.00
Hickory Firmer Chisel, ass'd.....\$ gr 4.50
Hickory Firmer Chisel, large.....\$ gr 5.00
Socket Firmer Chisel, ass'd.....\$ gr 3.00
Chisel, Fibre Head.....33¢
Hammer, Hatchet, Axe, &c.....40¢@40¢
Hoe, Rake, Shovel, &c.....60¢@10¢
Pat. Auger, Douglass.....\$ set \$1.25
Pat. Auger, Ives.....30¢@10¢
Pat. Auger, Swan's.....\$ set \$1.00
Saw and Plane.....40¢@10¢@50¢

Hangers—

Barn Door, New England.....70¢@70¢@5¢
Barn Door, old patterns.....70¢@70¢@5¢
Barry.....60¢
Best Anti-Friction.....60¢@10¢@10¢@5¢
Best.....60¢@10¢@10¢@5¢
Champion.....60¢@10¢
Chicago Anti-Friction.....60¢@10¢
Climax Anti-Friction.....50¢@55¢@5¢
Crescent.....60¢@10¢
Cronk's Patent, Steel Covered.....60¢@10¢
Duplex (Wood Track).....60¢@10¢
Economy, \$6.00.....60¢@10¢
Hamilton Wrought Steel Track.....55¢
Interstate.....60¢@10¢@10¢
Kidd's.....60¢@10¢@10¢
Lane's New Standard.....60¢@10¢@10¢
Lane's Parlor.....40¢@10¢@10¢
Lane's Standard.....50¢@10¢@10¢
Lundy Steel Parlor.....50¢@10¢@10¢
Magic.....50¢@10¢@10¢
Matchless.....60¢@10¢@10¢
Moody.....45¢
Moore's Baggage Car Door.....33¢@45¢
Moore's Elevator.....33¢@45¢
Moore's Railroad.....33¢@45¢
Nickel, Steel, Nos. 0, 25; 1, 20; 2, 15.....40¢@10¢@50¢
Orleans Steel.....55¢
Paragon No. 1, \$3.50; No. 2, \$4.50; No. 3, \$5.50 @ doz.....\$2.00
Paragon Parlor, per set.....\$2.00
Pendulum, Payson's.....40¢@10¢@10¢
Perfection.....50¢@10¢@10¢@10¢
Richards.....30¢@10¢@10¢
Richards Steel Anti-Friction.....55¢
Star.....40¢@10¢@10¢@10¢
Stearns' Anti-Friction.....20¢@10¢@10¢
Stearns' Challenge.....25¢@10¢@10¢
Sterling.....60¢@10¢@10¢@10¢
Terry's Ideal.....60¢@10¢@10¢@10¢
Terry's Modern.....60¢@10¢@10¢@10¢
Terry's Shield.....60¢@10¢@10¢
Terry's Solid.....60¢@10¢@10¢
Terry's Wrought Single Strap.....50¢@10¢
Victor, No. 1, \$16.00; No. 2, \$10.50; No. 3, \$13.00.....60¢@10¢
Warner's Pat.....50¢@10¢
Wild West.....50¢@10¢
Zenith for Wood Track.....55¢

Harness Snaps—See Snaps.**Hatchets—**

American Axe and Tool Co.....40¢ @ 50¢
Blood's.....40¢ @ 50¢
Hunt's.....40¢ @ 50¢
Hurd's.....40¢ @ 50¢
Mann's.....40¢ @ 50¢
Underhill's.....40¢ @ 50¢
O. Hammond & Son.....40¢ @ 50¢
Fayette R. Plumb.....40¢ @ 50¢
Collins.....40¢ @ 50¢
Buffalo Hammer Co.....40¢ @ 50¢
Kelly's.....40¢ @ 50¢
F. S. & W. Co.....40¢ @ 50¢
Sargent & Co.....40¢ @ 50¢
Schulte, Lohoff & Co.....40¢ @ 50¢
Ten Eyck Edge Tool Co.....40¢ @ 50¢

Hay and Straw Knives**See Knives.****Hinges—**

Blind Hinges—
Clark's
Nos. 1, 3, 5, 1888, Old Pattern.....75¢@10¢
Nos. 1 and 3, Tip Pattern.....75¢@10¢
No. 50 Buffalo Noiseless, 40, 60 and 85.....75¢
Buffalo Reversible, Nos. 3, 2, 1, 1, 1 and 0.....70¢@5¢
No. 1, Cottage for wood only.....80¢@5¢
No. 1, Diamond, for wood only.....80¢@5¢
Dixie L. & P., Nos. 3, 2, 1, 1, 0, 0, 4 and 5.....75¢@5¢
No. 25, Empire Reversible.....75¢@10¢
Lull & Porter, Nos. 3, 2, 1, 1, 1, 0, 4 and 5.....75¢@10¢
Mortise Gravity, Nos. 2, 4, 4, 4, 6, 8, 9 and 10.....50¢
Huffer.....50¢@50¢@10¢
Parker.....75¢@10¢
North's Automatic Blind Fixtures, No. 2, for Wood, \$9.00; No. 3, for Brick.....75¢@10¢
Reading's Gravity.....75¢@10¢@75¢@10¢
Sargent's Nos. 1, 3, 5, 11, 12, 13.....75¢@10¢@75¢@10¢
Shepard's:
Acme, Lull & Porter, Nos. 3, 2, 1, 1, 1, 1, 0, 0, 4 and 5.....75¢@5¢
Buffalo Gravity Locking, No. 75.....80¢@10¢
Clark's or Shepard's 1888, Old Pattern, Nos. 1, 3 and 5.....75¢@10¢
Clark's or Shepard's Tip Pattern, Nos. 1, 3 and 5.....75¢@10¢
Double Locking, Nos. 20 and 25.....70¢@5¢
Empire, Nos. 101 and 103.....75¢@5¢
Niagara Gravity Locking, Nos. 1, 3 and 5.....80¢@5¢
Noiseless, Nos. 60, 60, 65 and 55.....75¢
N. E. Lull & Porter, Nos. 3, 2, 1, 1, 1, 1, 0, 0, 4 and 5.....75¢@10¢
Pioneer, Nos. 080, 45 and 55.....75¢
Steamboat Gravity Locking No. 10.....80¢@10¢

Gate Hinges—

Automatic.....\$ doz. \$12.50, 50¢
Clark's, Nos. 1, 2, 3.....60¢@10¢@10¢@5¢
N. E. Lull & Porter, Nos. 3, 2, 1, 1, 1, 1, 0, 0, 4 and 5.....75¢@10¢
N. E. Reversible.....\$ doz. \$5.00, 60¢@10¢
N. Y. State.....\$ doz. \$4.00, 60¢@10¢
Shepard's Nos. 1, 2, 3.....60¢@10¢@10¢@5¢
Western.....\$ doz. \$4.20, 60¢@10¢@10¢

Spring Hinges—

Acme.....30¢
American.....20¢
Bardley's Patent Checking.....15¢
Barker's Double Acting.....25¢
Bonner's Japanned.....30¢
Bonner's All other Kinds.....30¢
Buckman's.....15¢@20¢
Champion.....60¢
Chicago.....30¢
Columbia.....\$ gross, \$10.00
Crown.....\$ gross, \$13.00
Devon, No. L.....\$ gr. \$13.00
Freeport.....\$ gr. \$12.00
Geer's Spring and Blank Butts.....40¢
Gem.....20¢
Ideal No. 3.....\$ gross \$8.00
J. G. C. Covered, \$ gr. \$30.....50¢@5¢
Knox.....\$ gross, \$12.00
Knox.....\$ gross, \$10.00
New Idea No. 1.....\$ gross, \$18.00
New Idea Dbl. Acting.....45¢
No. 10 Matchless.....60¢
No. 25 Unbreakable.....60¢
Oxford.....20¢
Reliable.....\$ gr. \$13.00
Royal.....60¢
Samson.....60¢@60¢@75¢
Stearns' Noiseless Floor Hinge.....\$ set. \$5.00, 20¢@10¢@30¢
Surprise.....\$ gross, \$12.00
Union Mfg. Co.....\$ gross, \$12.50
Union Spring Hinge Co's list
March, 1888.....20¢
Wiles, No. 1, \$ gr. \$16; No. 2.....\$15

Wrought Iron Hinges—

Strap and T. List May.....60¢@10¢@10¢
22, 1894.....60¢@10¢@10¢
Corrug'd Strap and T.....\$ doz. \$1.00, 1.00, 1.00, 1.00, 1.00
Hinges, 8, 10 & 12 in., \$ doz. \$1.00, 1.00, 1.00, 1.00, 1.00
Providence.....\$ doz. \$1.00, 1.00, 1.00, 1.00, 1.00
Rolled Blind Hinges, Nos. 32 and 34.....50¢@10¢
Rolled Blind Hinges, Nos. 282 and 284.....55¢@10¢
Rolled Plate.....70¢@10¢
Rolled Raised.....70¢@10¢
Screw Hook and Eye.....\$ in. \$ doz. \$1.00, 1.00, 1.00, 1.00, 1.00
Screw Hook and.....\$ 6 to 12 in., \$ doz. \$1.00, 1.00, 1.00, 1.00, 1.00
Strap.....\$ 14 to 20 in., \$ doz. \$1.00, 1.00, 1.00, 1.00, 1.00
Strap.....\$ 22 to 36 in., \$ doz. \$1.00, 1.00, 1.00, 1.00, 1.00

Hoes—

Scovill and Oval Pattern.....50¢@10¢@80¢
D. H. Scovill.....20¢@30¢
Grub.....60¢@10¢
Lane's Crescent, Planters' Pattern.....45¢@5¢
Lane's Razor Blade, Scovill Pat.....30¢@5¢

Handled—

Garden, Mortar, &c.....70¢@70¢@5¢
Magie.....\$ doz. \$4.00
Planter's Cotton, &c.....70¢@70¢@5¢
Warren Hoe.....60¢@10¢@5¢

Hog Rings and Rings—

See Rings and Rings.

Holisting Apparatus—

See Machines, Lifting.

Hollow-Ware—

See Ware, Hollow.

Holders—

Sensible Bag and Twine.....50¢
Springle's Pat.....\$ doz. \$18.....60¢

Bit—

Angular.....\$ doz. \$24.00, 40¢@5¢
Evenson.....40¢@10¢
Barber's.....\$ doz. \$15.00, 40¢@10¢
Ives.....\$ doz. \$20.00, 60¢@50¢@10¢

File and Tool—

Bain Pat.....\$ doz. \$4.00, 25¢
Nicholson File Holders.....20¢

Sash—

Motley's Adj. Sash, Medium Size.....\$ doz. \$1.20, 40¢

Hooks—

Cast Iron—
Bird Cage, Sargent's List.....60¢@10¢@10¢@70¢
Bird Cage, Sargent's List.....50¢@50¢@10¢
Clothes Line, Sargent's List.....50¢@50¢@10¢
Ceiling, Sargent's List.....50¢@50¢@10¢

Clothes Line, Moore's.....70¢

Clothes Line, Reading list.....60¢@10¢@50¢@10¢@10¢

Coat and Hat, Moore's.....70¢

Coat and Hat, Reading.....60¢@10¢@50¢@10¢@10¢

Coat and Hat, Sargent's list.....50¢@50¢@10¢

Hammer, E. C. Stearns & Co., \$ doz. 60¢

Harness, Reading list.....55¢@10¢@55¢@10¢@10¢

Wire—
Atlas, Coat and Hat.....33¢@45¢

Belt.....80¢@15¢@50¢@50¢

Handy Hat and Coat.....50¢@10¢@60¢

Indestructible Coat and Hat.....45¢@45¢@5¢

Steady Ceiling Hooks.....50¢@10¢@60¢

Williamson's Bird Cage Hooks, List April.....40¢

Wire Coat and Hat, Gem, list April, 1888.....60¢@10¢

Wire Coat and Hat, Miles, list April, 1888.....50¢@50¢@10¢

Wire Coat and Hat, Standard.....60¢@10¢@10¢

Bright Wire Goods—See Wire.

Wrought Iron—
Cotton Pat. (N. Y. Mallet and Handle) Wks.....\$ doz. \$1.25

Tassel and Picture, T. & S. Mfg. Co.....50¢

Wrought Staples Hooks, &c.....\$ doz. \$1.25

See Wrought Goods

Miscellaneous—
Bush.....55¢@60¢

Fish Hooks, American.....50¢@60¢

Grass, No. 2, \$2.00; No. 3, \$2.10; No. 4, \$2.25

Grass and Eyes—Brass.....60¢@10¢@10¢

Hooks and Eyes—Malleable Iron.....70¢@70¢@10¢

Noll's Grass.....\$ doz. \$2.25

Whiffletree, Patent.....\$ doz. \$2.25

Bench Hooks—See Bench Stops.

Horse Nails—See Nails, Horse

Horse Shoes—
See Shoes, Horse.

Hose, Rubber—
Competition, Fair quality.....75¢@75¢@10¢

Competition, Low Grade, 1/4 in. ft. 5¢, 5¢ Extra.....80¢@10¢@60¢@10¢@10¢

Standard.....70¢@10¢@70¢@10¢@5¢

N. Y. B. & P. Co., Double Diamond.....70¢

N. Y. B. & P. Co., 1846 Para.....40¢@5¢

Cotton Garden, 1/4 in., coupled.....\$ doz. \$1.00

Fair Quality, 1/4 in. ft.....7¢

Good Quality, 1/4 in. ft.....8¢

Knives—
Blair's Gloves, \$ doz. pair:

No. 138, \$6; No. 142, \$7; No. 145, \$7;

No. 146, \$9; No. 150, \$9; No. 152, \$7.50;

No. 170, \$2.....6¢

Blair's Pins, \$ gross:

No. 160, \$7; No. 165, \$10.50.....6¢

Doz. Styles A and B, \$2.40; E, \$2.10

Hubbard's Solid Steel.....\$ gr 4.50

Indurated Fiber Ware—
See Ware, Indurated Fiber.

Irons.

Curling—
Nicol's Patent Curling Iron Heater.....\$ doz. \$1.00

Silver Curling Grace Darling Curling Iron.....\$ doz. \$1.00

No. 65.....\$1.75

No. 66.....1.50

No. 67, Mustache.....1.25

Sad—
From 4 to 10, at factory.....\$ 100

B. B. Sad Irons, \$ (at factory) 25¢@25¢

Chinese Laundry (N.E. But. Co.) \$ 1.50

Chinese Sad.....\$ 3.34

Crown Improved.....60¢@10¢@10¢

Ideal Irons, No. 250, \$ set, 60¢; No. 255.....55¢

Mahony's Troy Pot. Irons.....25¢

Mrs. Potts' Sad Irons, per set.....\$ 60

Small lots.....\$ 75 70 30 76

National Self-Heating.....30¢

New England.....\$ 5. 20¢@10¢

Pottstown, \$ set, No. 45, 65¢; No. 40, 70¢

Salamanca Irons.....25¢@10¢

Self-Heating.....\$ doz. \$10.00, 20¢

Sensible Sad Irons, per set.....\$22.50, 25¢

Nos. 2 3 20 30

.60 .60 .65 .65

Sensible Tailor's Irons.....33¢@5¢

Soldering—
Soldering Coppers.....\$ 18@20¢

Covert's Adjustable, list Jan. 1, 1894.....35¢@2¢

Tinker's Dread.....\$ doz. \$1.75; \$ gr. \$18

Pinking—
Pinking Irons, \$ doz. 55¢@60¢.

Jack Screws—See Screws.

Jacks, Wagon—
Daisy.....33¢@5¢

Lockport.....40¢@40¢@5¢

Victor.....33¢@5¢

Kettles—
Brass, Spun, Plain, list Jan. 1, '91.....25¢@5¢

Brass, Spun, Pld. W.M. list Jan. 1, '91.....20¢@5¢

Stamped Brass Kettles.....\$ 19@20¢

Enamelled and Tea—See Ware, Hollow.

Knife Sharpeners—
See Sharpeners, Knife.

Knives—
Butcher, Shoe, &c.

Ames' Bread Knives, \$ doz. \$1.50, 15¢@20¢

Ames' Butcher Knives.....25¢

Ames' Shoe Knives.....25¢@40¢

Dick's Butcher Knives and Steels.....40¢

Foster Bros. Butcher, &c.....20¢@20¢@10¢

Moran's Shoe and Bread.....20¢@20¢@10¢

Nichols' Butcher Knives.....50¢

Wilson's Butcher Knives, list Dec 8, 1890.....25¢

W. W. Wilson, Butcher, 6 in., \$2.00; 7 in., \$2.70; 8 in., \$3.80; &c.....\$ doz. \$1.00

Hay and Straw—See Hay Knives.

Table and Pocket—Net Prices.

Corn—
Bradley's.....10¢

Wadsworth's.....25¢@25¢@10¢

Drawing—
Mix.....75¢@10¢@80¢

P. S. & W.....25¢@33¢@5¢

Adjustable Handle.....33¢

Bradley's.....33¢

Douglas's.....75¢@75¢@10¢

Pullers Nail—
 Economy, 1/2 doz., \$24.00, 40%
 Giant, No. 1, 1/2 doz., \$18.00, 10%
 Giant, No. 2, 1/2 doz., \$15.00, 10%
 Pelican, 1/2 doz., \$9.00, 25%
 Scranton, 1/2 doz., \$18.00, 33% & 35% & 10%

Pulleys—
 Brass Screw, 70%
 Hay Fork, "Anti-Friction," 5 in. solid, \$5.70
 Hay Fork, "F" Common and Patent, \$5.70
 Hay Fork, "Anti-Friction" 5 in. Wheel, 1/2 doz., \$12.00
 Hay Fork, Reed's Self-Lubricating, 60%
 Hay Fork, Solid Eye, \$4.00; Swivel, \$4.50
 Hay Fork, Stearns' Nos. 15, 25, 35, 55, 65, 80%
 Hay Fork, Tarbox Pat. Iron, 20%
 Hot House, Awning, etc., 60%
 Japanned Clothes Line, 60%
 Japanned Screw, 70%
 Japanned Side, 70%
 Moore's Ceiling Hnd. Anti-Friction, 60%
 Moore's Dumb Waiter Anti-Friction, 60%
 Moore's Electric Light, 35%
 Moore's Side, Anti-Friction, 60%
 Nash (Auger Mortise), On bol. lots ex. 5%
 Common Sense, 60%
 Empire, 60%
 Ideal, Nos. 2, 4, 10 & 15, 60% less 1%
 Star, 60%
 Ideal, or IXL No. 60, 22% net.
 Shade Rack, 45%
 Shepard's Niagara, No. 25, 1/2 doz 23% net
 Tackle Blocks—See Blocks.

Pumps—
 O'Brien, Best Makers, 60% & 10% to 70%
 Fitcher Spout, Best Makers, 70% to 10% to 75%
 Fitcher Spout, Cheaper G'ds., 75% to 10% to 75%
 Myers' Pumps, low list, 50%
 Detroit Valve & Washer Co.'s Pump, 50%
 Leathers, 1/2 gro \$4.00
Punches—
 Avery's Revolving, 40%
 Avery's Sawset and Punch—See Sawsets
 Bemis & Call Co.'s Cast Steel Drive, 50% & 5%
 Bemis & Call Co.'s Check, 55%
 Bemis & Call Co.'s Spring, 50% & 5%
 Bemis & Call Co.'s Springfield Socket, 55%
 Niagara Hollow Punches, 20% & 2%
 Niagara Solid Punches, 55%
 Rice Hand Punches, 15%
 Saddle's or Drive, good, 60% & 95%
 Spring, good quality, 1/2 doz., \$2.50 to \$2.80
 Spring, Leach's Pat., 1/2 doz., \$1.50
 Solid Tinner's, P., S., & W. Co., 55%
 Tinner's Hollow Punches, P., S., & W. Co., 20% & 2%

Rail—
 Barn Door, Light, In. 1/4 3/4 1/2
 Per 100 feet, \$1.75 2.10 2.75
 B. D. for N. E. Hanger, Small, Med. Large.
 Per 100 feet, \$2.00 2.50 3.00 Net
 Cronk's double braced Steel Rail, 31%
 foot, 31%
 Lundy Parlor Door, Planed Edge, 1/2 ft. 7%
 Moody Steel Rail, 1/2 ft., 55%
 Pease's Steel Rail, 1/2 ft., 55%
 Sliding Door, Bronzed Wrt Iron, 1/2 ft., 3%
 Sliding Door, Iron, Painted, 1/2 ft., 3%
 Sliding Door, Wrt Brass, 1/2 ft., 35% & 40% & 5%
 Terry's Steel Rail, 1/2 ft., 4%
 Victor Track Rail, 1/2 ft. foot, 50% & 10%

Rakes—
 Cast Steel, Association G'ds., 70% & 70% & 5% & 2%
 Cast Steel, outside goods, 70% & 70% & 5% & 2%
 Malleable, good, 70% & 70% & 5% & 2%
 Malleable, low grade, 70% & 70% & 5% & 2%
 Fort Madison Prise Bow Braces and
 Peerless, 65%
 Fort Madison Steel Tooth Lawn Rake, 65%
 30.00, 25%
 Gibbs, 1/2 doz., \$4.90
 Gibbs' Acme Lawn Rake, 1/2 doz., \$4.75
 Gibbs' Cantor's Lawn Rake, 1/2 doz., \$5.75
 Gibbs' Crown Lawn Rake, No. 1, 1/2 doz., \$4.90; No. 2, 1/2 doz., \$5.30
 Gibbs' Favorite Lawn Rake, 1/2 doz., \$5.30
 Gibbs' Hustler No. 0, 1/2 doz., \$4.25
 Gibbs' Hustler No. 1, 1/2 doz., \$4.40
 Oneida Lawn Rake, 1/2 doz., \$6.00

Razors—
 Campbell Cutlery Co., 50%
 Electric Cutlery Co., Net prices
 Gillette, 1/2 doz., \$15.00
 Jordan's A. & S. Co., Net prices
 Jordan's Old Faithful, new list, Net prices
 J. R. Torrey Razor Co., Net prices
 Wostenholm and Butcher, \$10 to 10% & 10%

Razor Strops—
 See Strops, Razor.

Reels—
 Clothes Line—
 Stearns', 33% & 10%

Fishing—
 Hendryx Aluminum, German Silver, Gold, Bronze, Silver Rubber, Popolo and Salmon, Single Action, Multiplying and Quadruple, all sizes, 25%
 Hendryx Single Action Series, 102P and PN, 202P and PN, 102P and PN, 202P and PN, 304P and PN, 00304P and PN, 502 and 502N, 802 and 802N, 02084N, Competitor, 50%
 Hendryx Multiplying and Quadruple Series, 3004N and PN, 4N and PN, 2004N, 2004P and PN, 02084P and PN, 0024 and 0024N, 5009N and PN, 40% & 10%

Registers—
 Moore's Bronze Finishes, 75%
 Moore's Electroplated, 80%
 Moore's Japanned, 80%
 Moore's Solid Bronze, 70%
 Moore's Stove Pipe, 33%

Rings and Ringers—
 Bull Rings—
 Humason, Bevelly & Co.'s, 80% & 80% & 10%
 Peck, Stow & W. Co.'s, 80% & 80% & 10%
 Sargent's, 80% & 80% & 10%

Hog Rings and Ringers—
 Note—The market on Hog Rings and Ringers is in a demoralized condition and prices are low and irregular. We therefore withdraw quotations for the present.

Rivets and Burrs—
 Copper, 60% & 60% & 10%
 Iron Norway, List Nov. 1, 1894, 65%
 Second Quality, 75%

Rivet Sets—See Sets.
Roasting and Baking Pans—See Pans, Roasting and Baking.

Rollers—
 Acme Moore's Anti-Friction, 50% & 10%
 Barn Door, Sargent's list, 60% & 10% & 10%
 Moore's Barn Door Star, 50%
 Union Barn Door Roller, 70%
 Thompson Mfg. Co.'s Lawn Rollers, 30%

Rope—The following prices are f.o.b., New York or factory, and are shaded 1/2% on large lots; terms, 1/4% for cash.
 Manila, 7-16 in. diam. and larger, 8%
 Manila, 1/4 and 5-16 in., 8%
 Manila, Tarred Rope, 7%
 Manila, Hay Rope, Med'm, 5%
 Sisal, 7-16 in. and larger, 5%
 Sisal, 1/4 and 5-16 in., 5%
 Sisal, Tarred Rope, 5%
 Sisal, Medium Lath Yarn, 4%
 New Zealand, 7-16 in. and larger, 5%
 New Zealand, 3/4 inch, 5%
 New Zealand, 1/2 and 5-16 in., 5%
 New Zealand, Hay Rope, 5%
 New Zealand, Tar'd Rope, 4%
 Cotton Rope, 12 to 15, 5%
 Jute Rope, 5% & 15, 6%

Wire Rope
 List Sept. 1, 1894. All kinds, 20% & 2% & 2%, cash

Rules—
 Boxwood, 50% & 10% & 80% & 10% & 10%
 Ivory, 50% & 10%
 Starrett's Steel Rules and Straight Edges, 25% & 10%

Sad Irons—See Irons, Sad.

Sand and Emery Paper and Cloth—
 See Paper and Cloth.

Sash Cord—See Cord, Sash.

Sash Locks—See Locks, Sash.

Sash Weights—
 See Weights, Sash.

Sausage Stuffers or Fillers—See Stuffers or Fillers, Sausage.

Saws—
 Note—Extra 5% to 10% often given.

Atkins' Circular, 50% & 10%
 Atkins' Band, 50% & 10%
 Atkins' Cross Cut, new list, 40%
 Atkins' Mulay, Mill and Drag, 50% & 10%
 Pease Circular Saw, 40%
 Atkins' Wood Saws, 40%
 Atkins' Hand Compass, &c., 45% & 5%
 Diaston's Circular, 45% & 5%
 Diaston's Cross Cut, list Jan. 1, 1893, 40% & 10%
 Diaston's Hand, 25%
 C. E. Jennings & Mill, 25%
 Pease Circular and Mill, 45% & 5%
 Peace Cross Cut, list Jan. 1, 1893, 45% & 10%
 Richardson's Circular and Mill, 45% & 5%
 Richardson's X Cut, list Jan. 1, 1893, 45% & 10%
 Richardson's Hand, &c., 25% & 25%
 Simonds' Circular Saws, 45% & 5%
 Simonds' Crescent Ground Cross Cut Saws, 30%
 Simonds' One Man Cross Cut, 40% & 10%
 Simonds' Gang, Mill, Mulay and Drag Saws, 45% & 5%
 Wheeler, Madden & Clemson Mfg. Co. Cross Cut, list Jan. 1, 1893, 45% & 10%
 Woodrough & McParlin, 30% & 10%
 Cross Cut, list Jan. 1, 1893, 45% & 10%
 Hand, Panel and Rip, 25% & 10%

Hack Saws—
 Eureka and Crescent, 25%
 Griffin's, complete, 40% & 10% & 50%
 Griffin's Hack Saw Blades, 40% & 10% & 50%
 Star Hack Saws and Blades, 25%

Scroll—
 Barnes' No. 1, 3; No. 6, 10; No. 7, 15, 25, 35%
 Barnes' Scroll Saw Blades, 35%
 Lester, complete, \$10.00, 25%
 Rogers, complete, \$4.00, 25%

Saw Frames—
 See Frames, Saw.

Saw Sets—See Sets, Saw.

Saw Tools—See Tools, Saw.

Scale Beams—
 See Beams, Scale.

Scales—
 Chatillon's Eureka, 25%
 Chatillon's Favorite, 40%
 Chatillon's Grocers' Trip Scales, 50%
 Family, Turnbuckle, 30% & 80%
 Hatch, Counter, No. 17, good quality, \$17.00 to \$18.00
 Hatch Tea, No. 161, 1/2 doz \$6.00 to \$6.50
 Hehle Bros' Platform, 40% & 10%
 Union Platform Plain, \$3.00 to \$3.10
 Union Platform, Striped, \$2.15 to \$2.25
 Standard, 50%
 Scissors, Fluting, 45%

Scrapers—
 Adjustable Box Scraper (S. R. & L. Co.), \$4.00, 40% & 10%
 Box, 1 Handle, 1/2 doz \$3.00 to \$4.00
 Box, 2 Handle, 1/2 doz \$3.00 to \$4.00
 Foot, 50% & 10% & 60%
 Ship, Common, 1/2 doz \$3.50
 Ship, R. I. Tool Co., 10%
 Tatum's Box, 25% & 10%

Screen Window and Door Frames—See Frames.

Screw Drivers—
 See Drivers, Screw.

Screws—
 Bench and Hand—
 Bench, Wood, Beech, 55% & 10% & 55% & 10% & 10%
 Bench, Wood, Hickory, 20% & 10%
 Hand, Wood, 35% & 10% & 25% & 10% & 5%
 Hand, Grand Rapids, 35%

Coach, Lag and Hand-Rail—
 Lag, Blunt Point, list Jan. 1, 1890, 85% & 85% & 10%
 Coach and Lag, Gimlet Point, list Jan. 1, 1890, 80% & 20% & 85%
 Hand Rail, Am. Screw Co., 80%
 Hand Rail, H. & B. Mfg. Co., 75% & 75% & 5%
 Hand Rail, Sargent's, 70% & 10% & 70% & 10% & 10%

Jack Screws—
 Millers' Pat., 50% & 10% & 10%
 Millers' Pat., 50% & 10%
 P., S. & W., 70% & 70% & 10%
 Sargent, 70% & 70% & 10%
 Stearns', 40% & 10%
 Tatum's, 25% & 10%

Cork—
 Detroit Cork Screw Co., 33% & 33%
 Humason & Beckley Mfg. Co., 40% & 10% & 50%
 Williamson's, 33% & 33% & 25%
 Williamson's Forged Worm, Applewood Handle, 1/2 doz., \$5.00; Rosewood, \$5.50, 40%

Machine—
 List August 1, 1894.

Wood—
 List January 1, 1891.

Flat Head Iron, 85%
 Round Head Iron, 75%
 Flat Head Brass, 85%
 Round Head Brass, 75%
 Flat Head Bronze, 80%
 Round Head Bronze, 75%
 Rogers' Drive Screws, 75% & 4%

Scythe Saws—See Saws, Scythe.

Scythes—
 Grain, 40% & 5% & 40% & 10%
 Grass, 40% & 10% & 25% & 50%

Scythe Snaths—
 See Snaths, Scythe.

Sets—
 Alken's Sets, Awls and Tools, No. 20, 1/2 doz \$10.00, 60% & 60% & 5%
 Common Brad Sets, No. 42, \$10.00; No. 48, \$12.50, 70% & 10% & 5%
 Fray's Ad. Tool Hds., Nos. 1, \$13; 2, \$13; 3, \$12; 4, \$9; 5, \$7, 50%
 Henry's Combination Haft, 1/2 doz \$6.00
 Millers' Pat. Ad. Tool Hds., No. 1, \$12; No. 4, \$12; No. 5, \$18, 25%
 Stanley's Excelsior, No. 1, \$7.50; No. 2, \$4.00; No. 3, \$5.50, 30% & 10%

Awl and Tool—
 Alken's Sets, Awls and Tools, No. 20, 1/2 doz \$10.00, 60% & 60% & 5%
 Common Brad Sets, No. 42, \$10.00; No. 48, \$12.50, 70% & 10% & 5%
 Fray's Ad. Tool Hds., Nos. 1, \$13; 2, \$13; 3, \$12; 4, \$9; 5, \$7, 50%
 Henry's Combination Haft, 1/2 doz \$6.00
 Millers' Pat. Ad. Tool Hds., No. 1, \$12; No. 4, \$12; No. 5, \$18, 25%
 Stanley's Excelsior, No. 1, \$7.50; No. 2, \$4.00; No. 3, \$5.50, 30% & 10%

Nail—
 Round, 1/2 doz \$3.25
 Square, 1/2 doz \$4.00 to \$4.25
 Buck Bros, 27%
 Cannon's Diamond Point, 1/2 doz \$12, 20%

Rivet—
 Regular list, 70%

Saw—
 Atkins' Criterion, 1/2 doz No. 1, \$6.00
 Atkins' Genuine, 1/2 doz, \$18.00, 50% & 10% & 60%
 Atkins' Imitation, 1/2 doz \$3.00 to \$3.25
 Atkins' Lever, 1/2 doz No. 1, \$6.00
 Avery's Saw Set and Punch, 50%
 Bemis & Call Co.'s Cross Cut, 30% & 5%
 Bemis & Call Co.'s Plate, 20%
 Bemis & Call Spring Hammer, 30% & 5%
 Common Lever, 1/2 doz \$2.00, 45% & 50%
 Crockett's Cross Cut, 1/2 doz \$3.00
 Croissant (Keller), No. 1, \$15.00, No. 2, \$24.00, 40% & 10% & 50%
 Diaston's Star, 25% & 25% & 45%
 Hammer, Bemis & Call Co.'s new Pat. 45%
 Hammer, Hotchkiss, \$5.50, 10%
 Hart's Pat. Lever, 20%
 Kohler's Giant Royal, 1/2 doz \$12.00
 Kohler's Royal, 1/2 doz \$7.00
 Leach's, No. 0, \$8.00; No. 1, \$15, 15% & 20%
 Leopold, 40% & 10% & 50%
 Lloyd's Acme, 1/2 doz \$15, 40% & 10%
 Morrill's No. 1, \$15.00, 40% & 20%
 Nos. 3 and 4, Cross Cut, \$23.00, 40% & 20%
 No. 5, Mill, \$31.00, 40% & 20%
 No. 10, \$15.50, 40% & 20%
 No. 11, \$16.00, 40% & 20%
 Nash's, 20% & 10% & 40%
 Stillman's Genuine, 1/2 doz \$5.00 to \$7.75, 40% & 5%
 Stillman's Pattern, Hand, 1/2 doz \$3.25; 1/2 doz \$5.50 to \$6.00
 Taintor Positive, 1/2 doz \$18, 60%

Sharpeners, Knife—
 Applewood Handles, 1/2 doz \$6.00, 50%
 Rosewood or Cocobolo, 1/2 doz \$9.00, 50%
 Tante Mills, 1/2 gr., \$14.40, 25% & 33% & 45%

Shaves, Spoke—
 Wood, 30%
 Bailey's (Stanley R. & L. Co.), 50% & 10%
 Clingman, 25% & 10%
 Goodall's, 1/2 doz \$9.00, 40% & 10%
 Stearns', 40% & 10%
 Tatum's, 25% & 10%

Shears—
 Acme Cast Shears, 40% & 40% & 5%
 American (Cast) Iron, 75% & 10% & 80% & 5%
 Barnard's Lamp Trimmers, 1/2 doz \$9.75
 Barnard, Solid Blade, Jap'd, 75%
 Best Solid Steel Blade, Nickel'd, 65%
 Cast Steel Trimmers:
 First quality, 80% & 10% & 80% & 10% & 10%
 Second quality, 80% & 10% & 80% & 10% & 10%
 Campbell Cutlery Co., Jap'd, 75%
 Nickel Plated, 85%
 Claus brand, Japanned, 70%
 Claus brand, Nickel'd, same list, 60%
 Clipper, 10% & 10% & 10% & 10% & 10%
 Davenport Cu. ry Co., 60% & 10%
 Diamond Cast Shears, 10% & 10% & 10% & 10%
 Eclipse Cast Shears, 40% & 10% & 50%
 Galvalme 3/4 to 1 in., 1/2 doz \$1.00, 1/2 inch Hatch Cutlery Co. Solid Steel Forged, 60% & 80% & 10%

Shims, List Dec. 1881.
 60% & 10% & 60% & 10% & 10% & 5%
 Heine's Tailor's Shears, 33% & 33%
 Howe Bros. & Hulbert, Solid Forged Steel, 40%
 Seymour's, list Dec. 1881, 60% & 10% & 60% & 10% & 10% & 5%
 Victor Cast Shears, 75% & 10% & 80%

Tinner's Snips—
 Cast Handles, Laid with Steel, 40%
 Niagara Snips and Shears, 20% & 10%
 Steel Laid, Claus, 70%
 Wrt. Handles, Steel Blades, 20% & 10%

Pruning Shears and Hooks—
 Diaston's Combined Pruning Hook and Saw, 1/2 doz \$18.00, 25% & 25% & 10%
 Diaston's Pruning Hook, 1/2 doz \$12.00, 25% & 25% & 10%
 Dunlap's Saw and Chisel, 25% & 25% & 10%
 Eagle Pruning Shears, 1/2 doz \$4.50, 50%
 Henry's Pruning Shears, 1/2 doz \$4.00, 50% & 10% & 5%
 \$4.25

Henry's Tree Pruner, 50% & 20%
 Levin Pruner No. 1, \$15.00, 1/2 doz, 40% & 5%
 Levin Pruner No. 2, \$21.00, 1/2 doz, 40% & 5%
 J. Mallinson & Co., No. 1, \$5.25; No. 2, \$7.35, 60%
 No. 100 Pruning Shear, 60%
 Pruning Shears, Henry's Pat., 1/2 doz, \$3.00 to \$3.25
 Pruning Shears, Conn. Pat., 1/2 doz \$2.50 to \$3.00
 P., S. & W. Co., 70%
 Telegraph Tree Pruner, 60% & 10%
 Waters' Tree Pruner, 80%
 Wheeler, M. & C. Co., Combination, 1/2 doz \$12.00

Tinner's, &c.—
 Shears and Snips (P. S. & W.), 30% & 25%
 Snips, J. Mallinson & Co., 33% & 33%

Sheaves—
 Siding Door—
 Corbin's list, 60% & 10% & 5%
 M. W. Co., list July, 1888, 50% & 10% & 50% & 5%
 Moore's Anti-Friction, 60%
 Patent Roller, Hastings, 60% & 10% & 5%
 R. & E. list Dec. 13, 1888, 55% & 50%
 Russell's Anti-Friction, list Dec. 13, 1888, 60% & 3%

Siding Shutter—
 Reading list, 60% & 10% & 10%
 R. & E., list Dec. 18, 1888, 60% & 10% & 2%
 Sargent's list, 70%

Shells—
 Brass Shot Shells, Club, Rival, Olinx, 85% & 10% & 35%
 Brass Shot Shells, list quality, 60% & 3%
 First quality 4, 8, 10 and 12 gauge, 25% & 10% & 3%

First quality Rival, Club and Olinx brands, 14, 16 and 20 gauge (7.50 list), 20% & 10% & 3%
 Price, 40% & 3%
 Smokeless brand, 12, 10, 16 gauge, 35% & 10% & 35%
 Star, Club, Rival and Olinx Brands, 35% & 10% & 35%

Shells, Loaded—
 Standard list, July 10, 1890, 40% & 10% & 40% & 10% & 10% & 10%

Ship Tools—
 L. & J. White, 30%

Shoes, Horse Mule, &c.—
 Horse—
 Burden's, Perkins', Phoenix, Standard, Shoenbergers', Diamond State, Old Dominion Bryden's Boss and Crescent, from jobbers, \$3.40 to \$4.75
 Bryden's Frog Pressure, \$4.00

Mule—
 Add 50 cents per keg to above prices.

Ox Wrought—
 Ton lots, 1/2 doz \$2.00
 1000 lb lots, 1/2 doz \$2.00
 500 lb lots, 1/2 doz \$2.00

Shot—
 July 27, Small lots.
 Drop, up to B, 25-b bag, \$1.10
 Drop, up to B, 5-b bag, \$1.10
 Drop, B and larger, 25-b bag, 1.40
 Drop, B and larger, 5-b bag, .85
 Buck and Chilled, 25-b bag, 1.40
 Buck and Chilled 5-b bag, 1.40
 Dust Shot, 25-b bag, 1.75
 Dust Shot 5-b bag, .40
 In ton lots, 1/2 doz \$2.00, and \$2.50 for cash.

Shovels and Spades—
 Ames' Shovels, Spades, &c., list Nov. 1, 1885 (except Nos. named below), 20%
 The following Nos. are sub'd to above count of 27 1/2": Nos. 548 to 672; 839 to 880; and Nos. 1004, 1009, 1014, 1019, 1024, 1027 and 1029.
 Griffith's Black Iron, 50% & 10% & 50% & 10% & 5%
 Griffith's Solid C. S. R. R. goods, 40%
 Hubbard & Co., Antim list, 25% & 30%
 Hubbard & Co.'s Chisholm Pattern, 50% & 10% & 10%
 Hussey, Rians & Co., No. 20 list, 30% & 35%
 Hussey, Bins & Co., No. 21 list, 20% & 30%
 H. M. Myers Co.,

Covert, New R. E. 60x10x5x2 1/2
 Fitch's (Bristol) 50x10x5
 German, new list 40x10x5
 Kelley & Woolworth's Steel Harness 50x10x5
 John Prots Snaps 75x7 1/2x5
 Sargent's Patent Guarded 70x10x10/70x10x10x10

Snaths—

Scythe 50x2x50x10x5

Snips, Tinners'—See Shears.**Soldering Irons—**

See irons, Soldering.

Spittoons, Cuspidors, &c.

Standard Fiberware 50x10x5

Cuspidors, 3 1/2 inch, 5 doz., No. 5, 8; No. 12, 8.

Spittoons, Daisy, 5 inch, No. 1, 10 and 11 inch, 50.

Spoke Shaves—

See Shaves, Spoke.

Spoke Trimmers—

See Trimmers, Spoke.

Spoons and Forks—

Tinned Iron—

Basting, Cen. Stamp. Co.'s list, 70x25x5

Buffalo, S. S. & Co. 85x4x25

Small Table and Tea, Cen. Stamp. Co.'s list, 70x25x5

Silver Plated—

4 months or 5x cash 30 days: 50x12x5

L. Boardman & Son 50x10x5

Holmes & Edwards Silver Co. 40, 15x5x5

Meriden Br. & Co., Rogers 40x15x5

Reed & Barton 40x40x5

Rogers & Bros. 40x15x5

R. Rogers & Bros. 40x15x5

Rogers & Hamilton 40x15x5

Wm. Rogers Mfg. Co. 40, 15x5x5

Simpson, Hall, Miller & Co. 40, 15x5x5

Miscellaneous—

Boardman's Britannia Spoons, case 50x5x5 cash

Boardman's Nickel Silver, list July 1, 1891 60x7x5x5

Britannia 60x60x5x5

German Silver 50x50x5x5

Nickel Silver 50x50x5x5 cash

Holmes & Edwards Silver Co. 50x10x5x5

No. 24 German Silver 50x10x5x5

No. 30 Silver Metal 50x10x5x5

No. 49 Nickel Metal 50x10x5x5

No. 50 Nickel Silver 50x5x5

No. 67 Mexican Silver 50x10x5x5

Rogers & Hamilton 40x15x5x5

Clometar, Flatware 40x15x5x5

Clometar, Stewards 40x15x5x5

Crown Hamilton, Flatware and Cutlery 30x

Steel Goods 40x10x5

Wm. Rogers Mfg. Co. 60x5x5

13x Rogers German Silver 50x5x5

23x Rogers Nickel Silver 50x5x5

Rogers Silver Metal 50x10x5x5

Spring—Door—

Champion (Col.) 55x10x5x5x10x5

Cowell, No. 1, 5 doz. \$13.00; No. 2, \$15.00

Gem (Col.), list April 19, 1886 50x50x10x5

Herules 50x50x10x5

Phoenix 33x4x3x5x5x5

Rubber, complete, 5 doz. \$5.50, 6 doz. \$7.00

Star (Col.), list April 19, 1886 20x10x5

Torrey's Rod, 32 in., 5 doz. \$1.20x1.25

Warner's No. 1, 5 doz. \$1.50; No. 2, \$2.40

Victor (Col.) 60x10x60x10x5x5

Carriage, Wagon, &c.—

Elipio, Concord, Platform and Half Borell 60x10x60x10x10x10 or net prices

Cliff's Bolster Springs 25x

Sprinklers, Lawn—

Gibbs Arc 5 doz., \$12.00

Gibbs Hustler 5 doz., \$8.00

Squares—

Nickel Plated 35x35x5x5

Steel and Iron 60x10x10x5

Try Square and T Bevels 60x10x10x5

Avery's Bevel Protractor 40x

Avery's Finish Square 40x

Diston's Try Sq. and T Bevels 50x50x11x5

Starrett's Micrometer Caliper Squares 25x

Winterbottom's Try and Miter 30x10x5

Squeezers—**Fodder—**

Blair's "Olimax" 5 doz. \$2.00

Blair's "Olimax" 5 doz. \$1.00

Lemon—

Porcelain Lined, No. 1 5 doz. \$6.00

Wood, Common 5 doz. \$1.70x1.75

Wood, No. 2 5 doz. \$3.00, 35x

Dean's, No. 1, 5 doz. \$5.50; 2, \$3.35; 3, \$1.65; Queen, \$2.50

Dunlap's Improved 5 doz. \$2.75, 20x11x5

Hotchkiss straight Flash 5 doz. \$2.50

Jennings' Star 4, 5 doz. \$2.50

King 40x2x5

Little Giant 50x50x5x5

The Boss 50x50x5x5

Standard Fiber Ware—

See Ware, Standard Fiber.

Staples—

Barbed Blind, 1/4 in. and larger, 5 doz. \$7.50

Barbed Blind, 1/4 in., 5 doz. \$8.50

Fence Staples, Galvanized, Same price

Fence Staples, Plain, Same price

Grand Crossing Tack Co.'s list, 75x10x5

Steel Butchers'—

C. & A. Hoffmann's 40x

Nichols Bros. 60x

Steelyards 40x10x50x5

Stocks and Dies—

Blacksmith's—

Butterfield's Goods 35x

Waterford Goods 35x

Wardner 35x

Green River 35x30x5

Lightning Screw Plate 35x30x5

Reeco's New Screw Plates 35x30x5

Reversible Ratchet 35x

Stone—

Stones, Grind—See Grindstones.

Scythe Stones—

Pike Mfg. Co., list April, 1892, 33x5x5

Cleveland Stone Co., list Nov. 1892, 33x5x5

Oil Stones, &c.—

Pike Mfg. Co.: Hindostan No. 1, 5 doz. \$4

Sand Stone 50x40x5

Turkey Oil Stone, 4 to 3 1/2 10x

in 32.00

Lily White Washita 60x

Rosy Red Washita 60x

Washita Stone, Extra 50x

Washita Stone, No. 1 40x

Washita Stone, No. 2 30x

Lily White Slips 60x

Rosy Red Slips 60x

Washita Slips, Extra 80x

Washita Slips, No. 1 70x

Arkansas Stone, No. 1, 3 to 5 1/2 in. \$2.50

Arkansas Stone, No. 1 1/2 to 3 in. \$3.50

Lake Superior 13x

Lake Superior Slips 20x

Tanite Mills: Emery Oil 5 doz., \$9.00, 50x65x5

Stops, Bench—

Cincinnati 25x10x5

Crescent 5 doz. \$1.50

Hotchkiss 5 doz. \$5, 10x10x10x5

McGills 5 doz. \$3 10x

Millers Falls 5 doz. \$11.00, No. 2, \$11.00

Morrill's 5 doz. \$10.00, No. 2, \$11.00

Stearns 30x10x5

Terrill's Nos. 1 and 2, 5 doz., \$3; No. 8, \$8.50

Weston's, No. 1, \$10, No. 2, \$9.25x10x5x5

Stove Polish—See Polish, Stove

Stretchers Carpet—

Cast Iron, Steel Polished 5 doz. 75x80x5

Cast Steel, Polished 5 doz. \$2.25

Socket 5 doz. \$1.75

Bullard's 25x10x5

Strops Razor—

Emerson C. Buff. 5 doz. \$2.30x\$3.00

Imitation Emerson 5 doz. \$1.25x\$1.50

Jordan's Pat. Padded, list Nov. 1, '89, 50x

Lamont Combination 5 doz. \$4.00

Stuffer Sausage—

Miles' Challenge, 5 doz. \$20, 50x50x5x5

Perry 5 doz. \$1, 50x50x50x10x5

Enterprise Mfg. Co., list Jan 17, '93, 25x

Silvers 40x10x5

Sweepers, Carpet and Lawn—

Acme 5 doz. \$26.00

Advance 5 doz. \$18.00

Grand 5 doz. \$36.00

Gold Medal 5 doz. \$27.00

Price 5 doz. \$27.00

Premier 5 doz. \$27.00

Superior 5 doz. \$27.00

Cosmopolitan 5 doz. \$27.00

Furniture Protector, Jap. 5 doz. \$24.00

Furniture Protector, Nickel 5 doz. \$27.00

Inter Ocean 5 doz. \$27.00

Ball 5 doz. \$48.00

Crown Jewel, No. 1, \$18.00; No. 2, \$19.00

Domestic, No. 1, 5 doz. \$20.00

Domestic, No. 2, 5 doz. \$22.00

Easy, Jap'd, 5 doz. \$22.00; Nickel, \$24.00

Excelsior 5 doz. \$20.00

Gem 5 doz. \$18.00

Gift Edge 5 doz. \$24.00

Grand Rapids, Japanned 5 doz. \$24.00

Grand Rapids, Nickel 5 doz. \$27.00

Housewife's Delight 5 doz. \$15.00

Improved Parlor Queen, Japanned 5 doz. \$24.00

Nickel 5 doz. \$27.00

Ladies' Friend 5 doz. \$15.00

Ladies' Friend No. 2 5 doz. \$16.00

Parlor Queen 5 doz. \$24.00

Standard 5 doz. \$24.00

Supreme 5 doz. \$22.00

Bissell Carpet Sweeper Co. make the following rebates:

\$1.00 per doz. in 5 doz. lots.

\$2.00 per doz. in 10 doz. lots.

Lawn—

Thompson Mfg. Co. 50x

Swings—

Davies Lawn 25x

Tacks, Brads &c.—

List October 19, 1889. Old established straight weights. Short weight goods are sold at lower prices.

Carpet Tacks—

American, Blued 47x5

American, Tinned and Cop'd 52x5

Steel, Blued and Cop'd 52x5

Steel Tinned and Cop'd 52x5

Swedes Iron, S. S., Blued 40x

Swedes Iron, S. S., Tinned 47x5

American Iron Tacks, Domestic 37x5

American Iron Tacks, Foreign 50x

Swedes Iron Tacks—

S. S., Blued 37x5

S. S., Tinned 43x5

Lanc., Blued 30x

Lanc., Tinned 37x5

Upholsterers', S. S. 47x5

Upholsterers', Lanc. 37x5

Gimp Tacks—

S. S., Blued 30x

S. S., Tinned 43x5

Lanc., Blued 20x

Lanc., Tinned 35x

Basket and Trimmers' Tacks—

Lanc. 20x

S. S. 20x

European Nails 30x

Common and Patent Brads 35x

Leathered Tacks 5x

Brush Tacks and Nails, S. S. 20x

Looking Glass Tacks, S. S. 5x

Picture-Frame Points, S. S. 12x5

Lace Tacks Blued 12x5

Lace Tacks, Tinned 12x5

Finishing Nails 52x5

Trunk and Clout Nails—

Black 52x5

Tinned or Coppered 57x5

Basket Nails 37x5

Chair Nails 35x

Cigar Box Nails 30x

Thin Tapped Nails 30x

Shoe Finders' List, Apr. 14, 1894.

F. H

Acme, Nickeled..... 40@40&5¢

Aiken's Pocket (Bright).....	\$2.50	& \$2.60
Alligator.....	60	& 10
Always Ready.....	33½	& 10 @ 40 & 5
Bemis & Call's:		
Adjustable S.....	35	& 4
Brigg's Pattern.....	80	& 10

Combination Black.....	40¢10¢
Combination Bright	40¢5¢
Cylinder or Gas Pipe.....	45¢5¢
Extra Heavy.....	45¢

Merrick's Pattern.....	45%
No. 8 Pipe Bright ...	55%
Bit Wrench, Adj., Tatum's.....	28 doz \$2 25 25%10%

Boardman's...	80@80&5%
Cincinnati Brace Wrenches.....	25&10%
Diamond Steel.....	55&5%

Donohue's Engineer.....	20@10%
Eagle.....	50@10%
Hercules.....	70@70@10%
Taft's Vice Wrench.....	55@10@8%

Tatum's Brace.....	25¢10%
The Favorite Pocket. 7 doz \$4...	40@40&5%
Walker's.....	55¢8%

Webster's Pat. Combination25%

Wringers, Clothes—

In lots of less than one dozen.
Am. Wringer Co.'s list, July 2, '94. 2% cash

Colby Wringer Co., list May 1, 1891..	2%	cash
Lovell Mfg. Co., list July 2, 1892..	2%	cash
Peerless Mfg. Co., list Feb., 1892..	2%	cash
National Wringer & Mfg. Co., list		

June 1, 1892.....2% cash

Wrought Goods=

Staples, Hooks, &c., list, March 17, 1893
85 & 25 00

Lard, City. Extra Winter...	57	②	..
Lard, City. Prime	58	②	

Lard, City, Extra No. 1.....	33	Ⓐ	48
Lard, City, No. 1.....	43	Ⓐ	45
Lard, Western, prime.....	56	Ⓐ	57
Cotton-seed, Crude, prime.....	25	Ⓐ	26
Cotton-seed, Crude, off grades.....	..	Ⓐ	24
low, prime..... Summer Yellow, off grades.....	31	Ⓐ	32
Sperm, Crude.....	28	Ⓐ	29
Sperm, Natural Spring.....	55	Ⓐ	56
Sperm, Bleached Spring.....	60	Ⓐ	61
Sperm, Natural Winter.....	62	Ⓐ	63
Sperm, Bleached Winter.....	67	Ⓐ	68
Whale, Crude.....	43	Ⓐ	44
Whale, Natural Winter.....	41	Ⓐ	42
Whale, Bleached Winter.....	43	Ⓐ	44
Whale, Extra Bleached.....	46	Ⓐ	47
Sea Elephant, Bleached Winter.....	48	Ⓐ	50
Menhaden, Crude, Sound.....	22	Ⓐ	23
Menhaden, Crude, Southern.....	25	Ⓐ	26
Menhaden, Light, Pressed.....	32	Ⓐ	33
Menhaden, Bleached Winter.....	25	Ⓐ	26
Menhaden, Extra Bleached.....	35	Ⓐ	36
Tallow, City, prime.....	51	Ⓐ	52
Tallow, Western, prime.....	50	Ⓐ	51
Cocconut, Ceylon.....	54	Ⓐ	54

Cocooning, Cochon	8	@	6 1/2
" " Domestic	28	@	32
Cod, Foreign	85	@	32
Red Elaine	56	@	38
Red Saponified	7 D		
Bank	49 1/2	@	26
Straits	25	@	25
Olive, Italian, bbls.	24	@	26
Palm, prime	60	@	58
Palm, prime, Lagos	60	@	62
" "	5	@	5 1/2

Mining Lanes—

Black, 20 gravity, 25 @ 30 cold test	6 1/2	@	7 1/2
Black, 20 gravity, 15 cold test	7	@	8
" summer, altered	5 1/2	@	6 1/2
Cylinder light, altered	12	@	20
Cylinder, dark, altered	10	@	15
Paraffine, 23 1/2 @ 24 gravity	11	@	12
Paraffine, 25 gravity	9 1/2	@	10 1/2
Paraffine, 28 gravity	7 1/2	@	7 1/2

ALL OTHER COUNTRIES

Per Annum, Postpaid.

Weekly Edition : \$5.00 = 125 francs = 20 marks =
11 florins = 6 roubles (coin) = 25 lire = 30 pesetas.

Semi-Monthly Edition : \$2.50 = 10/ = 12½ francs = 11
marks = 6 florins = 3 roubles (coin) = 12½ lire = 10 pesetas.

Monthly Edition : \$1.25 = 5/ = 6¼ francs = 5 marks =
3 florins = 1½ roubles (coin) = 6¼ lire = 5 pesetas.

ONE INCH)

-	-	-	-	\$30.00
-	-	-	-	50.00

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